191069

EX·LIBRIS·COLL·MED·PHILAD·INSTIT·A·D·MDCCLXXXVII
NON SIBI SED TOTI

Class ______ No. ______

In Exchange.

Bd .2.95

LIBRARY OF THE
COLLEGE OF PHYSICIANS
OF PHILADELPHIA

Digitized by the Internet Archive
in 2016 with funding from
The National Endowment for the Humanities and the Arcadia Fund

https://archive.org/details/minnesotamedicin3919minn

MINNESOTA MEDICINE

Official Journal of

Duluth Surgical Society, Minneapolis Academy of Medicine, Minneapolis Surgical Society, Minnesota Academy of Medicine, Minnesota Society of Clinical Pathologists, Minnesota Society of Internal Medicine, Minnesota State Medical Association, Minnesota Obstetric and Gynecologic Society, Minnesota Surgical Society, Northern Minnesota Medical Association, Southern Minnesota Medical Association.

Owned and Published by
THE MINNESOTA STATE MEDICAL ASSOCIATION
Under the Direction of Its

EDITING AND PUBLISHING COMMITTEE
E. M. Hammes, Sr., M.D., *Chairman,* Saint Paul
F. M. Owens, Jr., M.D., Saint Paul
T. A. Peppard, M.D., Minneapolis
H. L. Ulrich, M.D., Minneapolis

BUSINESS MANAGER
R. R. Rosell

BOARD OF EDITORS
Arthur H. Wells, M.D., *Editor-in-Chief,* Duluth
Stuart W. Arhelger, M.D., Minneapolis
John F. Briggs, M.D., Saint Paul
S. Francis Ceplecha, M.D., Redwood Falls
Tague C. Chisholm, M.D., Minneapolis
Robert B. Howard, M.D., Minneapolis
R. Drew Miller, M.D., Rochester
Henry G. Moehring, M.D., Duluth
Glenn J. Mouritsen, M.D., Fergus Falls
Olive V. Seibert, B.A., Saint Paul
George Stilwell, M.D., Rochester

VOLUME 39

JANUARY-DECEMBER, 1956

PUBLICATION OFFICE
2642 University Avenue - - - - - - - - - Saint Paul 14, Minn.

© 1956 by the
Minnesota State Medical Association

MSMA Annual Meeting—Rochester, May 21-23, 1956

Minnesota MEDICINE

PUBLISHED MONTHLY BY THE MINNESOTA STATE MEDICAL ASSOCIATION

Volume 39 JANUARY, 1956 Number 1

Printed in U.S.A. (Table of Contents—Pages A-2 and A-3) 40c a copy—$3.00 a year

COLLEGE OF PHYSICIANS LIBRARY FEB 1956 OF PHILADELPHIA

Strep sore throat responds readily to

ILOTYCIN

(Erythromycin, Lilly)

Temperature normal, throat culture negative, usually within twenty-four hours. Notably safe and well tolerated.

dosage: 1 to 1.5 Gm. daily in divided doses.

Lilly

532178

191969 JUL 24 1958

new vistas

for the . . . .

Effective control of seizures, social acceptance, and recognition of employment potential are providing new vistas for the majority of epileptic patients. Accurate diagnosis and adequate therapy, as in present-day management, can be expected more confidently than ever before to restore such patients to as full a life as is compatible with their condition.

DILANTIN® SODIUM

(diphenylhydantoin sodium, Parke-Davis)

Alone or in combination, DILANTIN continues as an anticonvulsant of choice for control of grand mal and of psychomotor seizures. In addition to its notable effectiveness, DILANTIN has little or no hypnotic effect.

DILANTIN Sodium is supplied in a variety of forms—including Kapseals® of 0.03 Gm. (½ gr.) and 0.1 Gm. (1½ gr.) in bottles of 100 and 1,000.

PARKE, DAVIS & COMPANY DETROIT, MICHIGAN

Volume 39

Minnesota

Contents for

SCIENTIFIC ARTICLES

ORIGINAL CONTRIBUTIONS

Surgical Treatment of Certain Congenital Cardiovascular Abnormalities in Infants and Children
Philip E. Bernatz, M.D., James W. Dushane, M.D., and John W. Kirklin, M.D., Rochester, Minnesota 1

Causal and Preventive Aspects of Environmental Cancer
W. C. Hueper, M.D., Bethesda, Maryland.................. 5

Problems in Clinical Diagnosis and Classification of Ventricular Hypertrophy in Adults
I. Idiopathic Left Ventricular Hypertrophy
Ben Sommers, M.D., Saint Paul, Minnesota............... 12

A Study of Ruptured Uteri
J. A. Malerich, Jr., M.D., West Saint Paul, Minnesota 16

Study of 200 Consecutive Patients Hospitalized for Asthma
Louis E. Prickman, M.D., Robert L. Sommerville, M.D., and Rodney D. Steinmetz, M.D., Rochester, Minnesota 20

SPECIAL ARTICLE

The Prospect for Tuberculosis Control
S. Marx White, M.D., Minneapolis, Minnesota......... 23

SEMINAR

Banti's Syndrome
Ananda S. Prasad, M.D., Minneapolis, Minnesota...... 28

CASE PRESENTATIONS

Hematoma of the Retropharyngeal Space Causing Tracheal and Esophageal Obstruction
Josiah Fuller, M.D., Frank J. Hirschboeck, M.D., and Robert H. LaBree, M.D., Duluth, Minnesota 33

Locked Twins, Chin to Chin, Obstructing Labor
Charles H. McKenzie, M.D. and Henry W. Quist, Jr., M.D., Minneapolis, Minnesota.......................... 35

LABORATORY AIDS

Acute Infectious Hepatitis: Laboratory Aids in Management
George G. Stilwell, M.D., Rochester, Minnesota.......... 37

CURRENT CARDIAC CONCEPTS

The Value of Prolonged Anticoagulant Therapy
Joseph F. Borg, M.D., Saint Paul, Minnesota............. 39

Official Journal of

Duluth Surgical Society
Minneapolis Academy of Medicine
Minneapolis Obstetrical and Gynecological Society
Minneapolis Surgical Society
Minnesota Academy of Medicine
Minnesota Society of Clinical Pathologists

Owner and Publisher

Published by MINNESOTA STATE MEDICAL ASSOCIATION
496 Lowry Medical Arts Building
St. Paul 2, Minnesota

Editing and Publishing Committee

E. M. Hammes, M.D.
Chairman, Saint Paul

F. M. Owens, Jr., M.D.
Saint Paul

T. A. Peppard, M.D.
Minneapolis

Henry Ulrich, M.D.
Minneapolis

Business Manager

R. R. Rosell
496 Lowry Medical Arts Building
St. Paul 2, Minnesota

GENERAL

Authors

Manuscripts should be addressed to Arthur H. Wells, M.D., Editor, 915 East First Street, Duluth 5, Minnesota. Telephone RA 7-6636 or JA 5-2319. Original papers prepared for publication solely in Minnesota Medicine will be considered by the Board of Editors providing they fulfill the following editorial standards. Manuscripts should be typed double spaced on white paper with at least 1-inch margins. The original (not a carbon copy) is requested. The title on the first page should be under six words if possible or divided into two parts. The author should give his highest degree, his institutional position or his relationship to a hospital or medical organization which he may be addressing. Pages should be numbered consecutively and the author's last name should appear at the top of each page after the first page.

Biographical references should appear on a separate sheet entitled "Bibliography." They should appear and be numbered consecutively in the order in which they first occur in the text (not alphabetically). Citations in the text require reference numbers if the author's or authors' names are not used or if there is more than one reference to the same author or group of authors. All references to author should appear in the Bibliography and no references should be included which are not in the text. The style and exact punctuation used in the J.A.M.A. references is requested. For a journal this is: *Author's last name, initial, initial.: title of paper. Abbreviated name of journal, volume number: page, year.* Book references should give author, title, edition number, city, publisher and year.

Illustrations (photographs, tables and graphs) should be submitted separately and not combined in the text. There should be a separate sheet entitled "Illustrations" which contains the various types of illustrations listed separately and numbered in the order

Medicine

Number 1

January, 1956

MISCELLANEOUS ARTICLES

EDITORIALS

Vive la Difference 40
Oral Communication 40
Psychosomatic Medicine 41
Present Treatment of Pulmonary Emphysema 41
Divorce and Family Relationships 43
Travelers Checks and Letters of Credit 43
New Fields and Responsibilities in Tuberculosis Research 44
The Nursing Team 44

PHOTOGRAPH

R. H. Wilson, M.D., President, Minnesota State Medical Association 46
PRESIDENT'S LETTER 47

MEDICAL ECONOMICS

Social Security—Big Issue in 1956 48
North Central Medical Conference Meets in Saint Paul 49

THE DEAN'S PAGE

Wanted: More Applicants for Medical School 51

HISTORY OF MEDICINE IN MINNESOTA

The Medical History of Rice County (1855-1901)
Adolph M. Hanson, M.D., Faribault, Minnesota 52

PUBLIC HEALTH

Recommended Practices in the Prevention of Retrolental Fibroplasia 61

MISCELLANEOUS

AMA Delegates' Report 62

IN MEMORIAM

Samuel H. Boyer 63
Charles Fay Brigham, Sr. 63
Ralph H. Creighton 63
Charles E. Dutton 63
Reinhold Milton Ericson 63
Raymond F. Hedin 64
John Burton Holst 64
Walter J. Marcley 64
Samuel Miller 64
Robert Lyman Nelson 65
Burt Frank Osburn 65
Henry William Quist 65
John Alois Thabes 65
Howard H. Wolfe 65
REPORTS AND ANNOUNCEMENTS 66

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

Montevideo Man Sentenced on Abortion Charge 67
WOMAN'S AUXILIARY 68
GENERAL INTEREST A-34
BOOK REVIEWS A-38
INDEX TO ADVERTISERS A-40

Minnesota Society of Internal Medicine
Minnesota State Medical Association
Minnesota Obstetric and Gynecologic Society
Minnesota Surgical Society
Northern Minnesota Medical Association
Southern Minnesota Medical Association

INFORMATION

n which they appear in the text. All photographs must be in black and white, clear ut, contrasting, and on glossy prints. Instructions for combining photographs are cceptable. Any number of illustrations over 4 are charged to the author. Combinations f photographs up to one-half page (6 x 4⅜ inches) count as 1 illustration.

Readers and Reviewers

The right is reserved to reject material submitted for reading or advertising columns. The views expressed in this journal do not necessarily represent those of the Minnesota State Medical Association or any of its constituents.

Advertisers and Subscribers

Classified advertising—10 cents a word; minimum charge $2.00; key number, 25c dditional. Remittance should accompany order. Display advertising rates on request.

Annual Subscription—$3.00. Single Copies—$0.40. Foreign and Canadian—$3.50.

Communications concerning advertising and subscriptions should be addressed to MINNESOTA MEDICINE, 2642 University Avenue, Saint Paul 14, Minnesota. Telephone Midway 6-2641.

Copyright and Post Office Entry

Contents of MINNESOTA MEDICINE ©1956 by Minnesota State Medical Association.

Entered at the Post Office in Saint Paul as second class matter. Accepted for mailing at he special rate of postage provided for in Section 1103, Act of October 3, 1917, uthorized July 13, 1918.

Board of Editors

ARTHUR H. WELLS, M.D.
Editor-in-Chief, Duluth

STUART W. ARHELGER, M.D.
Minneapolis

JOHN F. BRIGGS, M.D.
Saint Paul

ALEX E. BROWN, M.D.
Rochester

S. FRANCIS CEPLECHA, M.D.
Redwood Falls

TAGUE C. CHISHOLM, M.D.
Minneapolis

ROBERT B. HOWARD, M.D.
Minneapolis

HENRY G. MOEHRING, M.D.
Duluth

GLENN J. MOURITSEN, M.D.
Fergus Falls

OLIVE V. SEIBERT, B.A.
Saint Paul

GEORGE STILWELL, M.D
Rochester

24-hour control

for the majority of diabetics

10 cc.
'WELLCOME'
GLOBIN INSULIN
WITH ZINC
'B. W. & CO.'
40 UNITS IN 1 CC
Burroughs Wellcome
MADE IN U.S.A.

GLOBIN INSULIN
'B.W. & CO.'®

a clear solution . . . easy to measure accurately

Discovered by Reiner, Searle, and Lang
in The Wellcome Research Laboratories

BURROUGHS WELLCOME & CO. (U. S. A.) INC. • Tuckahoe 7, New York

Pork in the Human Dietary

PORK MAY be looked upon as an important factor in America's general health and well-being. The average intake of pork in America is about 46 pounds of lean pork and 20 pounds of bacon and salt pork per person each year.[1] But America's demand for pork goes further than taste appeal and deeper than mere statistics. Pork makes a valuable contribution to day-in-and-day-out nutrition.

Pork rates among the foremost sources of thiamine. As a source of all other B vitamins and many essential minerals, such as iron and phosphorus, pork meat is considered an important dietary constituent.

Lean pork is virtually completely digestible. Its protein serves to promote growth and aid in the maintenance of tissue cells. Like all high quality protein, that of pork aids in the elaboration of protein hormones, enzymes, and antibodies.

Pork constitutes a valuable part of the daily diet (Table I), and also contributes importantly to the nutrition of the pregnant woman (Table II).

Pork and pork products have won America's favor by their unique combination of economy, palatability, and nutritional value.

---

1. Consumption of Food in the United States, 1909-1952, Washington, D.C., United States Department of Agriculture, Bureau of Agricultural Economics, Agricultural Handbook No. 62, September, 1953.
2. Watt, B.K., and Merrill, A.L.: Composition of Foods —Raw, Processed, Prepared, Washington, D.C., United States Department of Agriculture, Agricultural Handbook No. 8, 1950.
3. Bowes, A. deP., and Church, C.F.: Food Values of Portions Commonly Used, ed. 7, Philadelphia, Anna dePlanter Bowes, 1951.
4. Cheldelin, V.H., and Williams, R.J.: Studies on the Vitamin Content of Tissues, 11, Houston, Texas, University of Texas Publication No. 4237, 1942.
5. Schweigert, B.S.; Nielsen, E.; McIntire, J.N., and Elvehjem, C.A.: Biotin Content of Meat and Meat Products, J. Nutrition *26*:65 (July) 1943.
6. Scheid, H.E., and Schweigert, B.S.: The Vitamin B_{12} Content of Meat, Annual Report, An Outline of Research During the Fiscal Year 1953-54, Chicago, American Meat Institute Foundation, Bull. 22, 1955.
7. Estimated on basis of protein content of meats. Sherman. H.C.: Food Products, ed. 4, New York, The Macmillan Company, 1948 p. 155.
8. Recommended Dietary Allowances, Washington, D.C., National Academy of Sciences—National Research Council, Publication 302, 1953.

Cooked Pork Chops, Ham, and Pork Sausage
Nutrients and Calories Provided by 3-Ounce Portions

TABLE I	Protein Gm.	Thiamine mg.	Niacin mg.	Riboflavin mg.	Iron mg.	Phosphorus mg.	Calories
Pork Chops, without bone, cooked, 3 oz.[2]	20	0.71	4.3	0.20	2.6	200	284
Ham, without bone, cooked, 3 oz.[2]	20	0.45	4.0	0.20	2.6	202	338
Pork Sausage, cooked, 3 oz.[3]	14	0.42	2.8	0.20	2.1	139	396

3.5 ounces of fresh pork loin, equivalent to approximately 3 ounces of cooked loin, contains 0.47 mg. pantothenic acid;[4] 0.10 mg. pyridoxine;[4] 0.005 mg. biotin;[5] 36 mg. inositol;[4] 0.08 mg. folic acid;[4] 0.0027 mg. vitamin B_{12};[6] 63 mg. chlorine;[7] 0.1 mg. copper;[7] 20 mg. magnesium;[7] 280 mg. potassium;[7] 70 mg. sodium;[7] and 0.01 mg. manganese.[7]

TABLE II

Nutrients and Calories of Cooked Pork Chops (3 ounces) Expressed as Percentages of Recommended Daily Dietary Allowances[8]

Percentages of Allowances for:	Protein	Thiamine	Niacin	Riboflavin	Iron	Phosphorus	Calories
Girls, 13-15 years of age; weight, 108 lb.; height, 63 inches.	25%	55%	33%	10%	17%	15%	11%
Women, 25 years of age; weight, 121 lb.; height, 62 inches.	31%	59%	36%	14%	22%	17%	12%
Pregnant Women (3rd trimester)	25%	47%	29%	10%	17%	13%	11%

The nutritional statements made in this advertisement have been reviewed by the Council on Foods and Nutrition of the American Medical Association and found consistent with current authoritative medical opinion.

American Meat Institute
Main Office, Chicago... Members Throughout the United States

CHILDREN'S SIZE BAYER ASPIRIN
FLAVORED
Children's Size
BAYER
ASPIRIN
BAYER
Genuine
24 TABLETS
2½ gr. ea.
PRICE 15¢
½ TABLET = 1¼ gr.
THE BEST TASTING ASPIRIN
YOU CAN GIVE YOUR CHILD
℞

How to win *little* friends . . .

The Best Tasting Aspirin you can prescribe.
The Flavor Remains Stable down to the last tablet.
15¢ Bottle of 24 tablets (2½ grs. each).

We will be pleased to send samples on request.

THE BAYER COMPANY DIVISION
of Sterling Drug Inc.
1450 Broadway, New York 18, N. Y.

Sweet*10 a new cyclamate sweetener for sugar-restricted diets!

Sweet-10 can help many of your patients. Used in place of sugar, Sweet-10 is valuable in weight control and in low salt and sugar-free diets.

NON-NUTRITIVE SWEETENER
6 fluid ounces
Sweet*10
10 TIMES SWEETER
than sugar
To be used in place of sugar. Sweet-10 is a water solution of 17% cyclamate calcium, 0.1% Benzoic acid and 0.05% Methylparaben. Should be used only by persons who must restrict their intake of ordinary sweets.

Sweet-10's radio and newspaper promotion will suggest its use with coffee, tea, cereals and fruit or in cooked or baked foods. No calories . . . adds no weight.

Sweet-10's advantages over saccharin-type sweeteners will be stressed. Sweet-10 can be used in cooking, leaves no bitter aftertaste. *More economical than other cyclamate sweeteners.*

Sweet-10 is a water solution of 17% cyclamate calcium, 0.1% Benzoic acid and 0.05% Methylparaben. Also available in powder and tablet forms (cyclamate calcium). Now available in food stores.

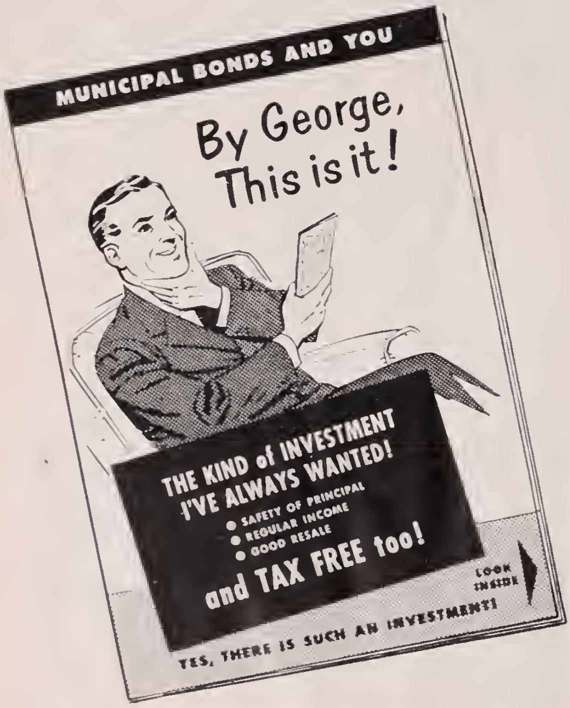
Sweet*10 TIDY HOUSE PRODUCTS CO., Shenandoah, Iowa

WHAT DOES 4% INTEREST REALLY MEAN TO YOU?

. . . Noting that there is no Federal Income Tax on Interest from Municipal Bonds

IN INCOME TAX BRACKET	INTEREST	IS ACTUALLY WORTH
$10 to $12,00	4%	6.45%
$16 to $18,000	4%	8.00%
$20 to $22,000	4%	9.09%
$32 to $38,000	4%	11.43%
$44 to $50,000	4%	14.29%
$60 to $70,000	4%	18.18%
$80 to $90,000	4%	25.00%

For More Details about the advantages of Investing in Municipal Bonds write for our Free Booklet . . .


MUNICIPAL BONDS AND YOU
By George, This is it!
THE KIND of INVESTMENT I'VE ALWAYS WANTED!
● SAFETY OF PRINCIPAL
● REGULAR INCOME
● GOOD RESALE
and TAX FREE too!
LOOK INSIDE
YES, THERE IS SUCH AN INVESTMENT!

"MUNICIPAL BONDS AND YOU"

Name______________________________

Address____________________________

City__________________ State_______

MM-1-6

JURAN & MOODY, INC.

Municipal Bonds Exclusively

Rand Tower in MINNEAPOLIS, MINN.—Citizens and Southern Bldg. in ATLANTA, GA.—93 East 6th St. in ST. PAUL, MINN.

when Sniffles hit the classroom

AND NASAL CONGESTION MAKES YOUNGSTERS MISERABLE

Neo-Synephrine®

HYDROCHLORIDE

Pediatric Nasal Spray

0.25% · 20 cc.

contains Zephiran® chloride 1:5000, antibacterial wetting agent and preservative for greater efficiency

*Designed specifically for children**

Prompt and Prolonged Decongestion
Sinus Drainage and Aeration

NO STING · NO SEDATION · NO EXCITATION

Plastic Unbreakable Squeeze Bottle
Leakproof, Delivers a Fine Mist

*Also well suited for adults who prefer a mild spray.

Winthrop LABORATORIES · NEW YORK 18, N. Y. · WINDSOR, ONT.

Neo-Synephrine (brand of phenylephrine) and Zephiran (brand of benzalkonium, as chloride, refined), trademarks reg. U.S. Pat. Off.

the drug of choice

. . . as a tranquilizing (ataractic) agent*
in anxiety and tension states
. . . in hypertension

RAUDIXIN

Squibb Whole Root Rauwolfia

As a tranquilizing agent in office practice, Raudixin produces a calming effect, usually free of lethargy and hangover and without the loss of alertness often associated with barbiturate sedation. It does not significantly lower the blood pressure of normotensive patients.

In hypertension, Raudixin produces a gradual, sustained lowering of blood pressure. In addition, its mild bradycardic effect helps reduce the work load of the heart.

- **Less likely to produce depression**
- **Less likely to produce Parkinson-like symptoms**
- **Causes no liver dysfunction**
- **No serial blood counts necessary during maintenance therapy**
- Raudixin is not habit-forming; the hazard of overdosage is virtually absent. Tolerance and cumulation have not been reported.
- Raudixin supplies the *total* activity of the whole rauwolfia root, accurately standardized by a rigorous series of test methods. The total activity of Raudixin is not accounted for by its reserpine content alone.

Supply: 50 mg. and 100 mg. tablets, bottles of 100 and 1000.

℞
Raudixin Tabs
100 mg.
Disp. #100
Sig.: 1 tab. t.i.d.

*Ataractic, from ataraxia: calmness untroubled by mental or emotional excitation. (Use of term suggested by Dr. Howard Fabing at a recent meeting of the American Psychiatric Association.)

SQUIBB

'RAUDIXIN'® IS A SQUIBB TRADEMARK

KNOX Protein Previews

1
2
Meal Planning
for the
SICK and
CONVALESCENT
with menus and
recipes

New Booklet Presents
Latest Facts on Feeding the Sick

KNOX
32 ENVELOPE ECONOMY DIET SIZE
UNFLAVORED
GELATINE

Adequate nutrition during illness and convalescence is essential for recovery whether the patient is managed in the hospital or at home. In the latter case, physicians often must devote much time to instructing those responsible for caring for the sick in good nutritional practices.

"Meal Planning for the Sick and Convalescent" has been designed to relieve you of the need for repeating over and over again essential dietary facts. This new Knox booklet presents in layman's language the latest nutritional applications of proteins, vitamins and minerals, gives practical hints on serving food to adults and children, suggests ways to stimulate appetite and describes diets from clear liquid to full convalescent. Best of all it offers the homemaker for the first time detailed daily suggested menus for each type of diet, plus 14 pages of tested nourishing recipes.

If you would like copies of this new timesaving Knox booklet for your practice, use the coupon below.

Chas. B. Knox Gelatine Company, Inc.
Professional Service Department SJ-13
Johnstown, N. Y.

Please send me.......copies of the new Knox "Sick and Convalescent" booklet.

YOUR NAME AND ADDRESS

Yes, you can have Real Tobacco Taste in a Filter Cigarette!

The VICEROY filter tip contains 20,000 tiny filters made exclusively from pure, white cellulose. This is twice as many as the next two largest-selling filter brands.

No wonder VICEROY gives you that fresh, clean, real tobacco taste you miss in other filter brands. No wonder so many doctors now smoke and recommend King-Size VICEROYS.

ONLY VICEROY GIVES YOU
20,000 Tiny Filters-
TWICE AS MANY AS THE NEXT TWO LARGEST-SELLING FILTER BRANDS . . . FOR REAL TOBACCO TASTE!
VICEROY
Filter Tip
CIGARETTES
KING-SIZE
King-Size Filter Tip VICEROY
World's Most Popular Filter Tip Cigarette
Only a Penny or Two More
Than Cigarettes Without Filters

RAPIDLY EFFECTIVE

BROAD-SPECTRUM ANTIBIOTIC THERAPY

. . . WELL TOLERATED . . .

BY THE INTRAMUSCULAR ROUTE

TERRAMYCIN®

Brand of oxytetracycline

INTRAMUSCULAR

"IN CHILDREN, GASTROENTERITIS, CROUP, MENINGITIS, AND INFECTIONS COMPLICATING CERTAIN SURGICAL CONDITIONS MAY BE ADEQUATELY TREATED BY ITS USE AND IT IS . . . [A] DRUG OF CHOICE WHEN ORAL MEDICATION IS NOT POSSIBLE."*

*Schaefer, F. H.: Ohio State M. J. 51:347 (April) 1955.

TERRAMYCIN INTRAMUSCULAR

Single-dose vials providing 100 mg. crystalline oxytetracycline hydrochloride, 5 per cent magnesium chloride and 2 per cent procaine hydrochloride.

Pfizer PFIZER LABORATORIES, Division, Chas. Pfizer & Co., Inc., Brooklyn 6, N. Y.

Get the Facts!!

about the

PROFESSIONAL CREDIT PROTECTIVE BUREAU

The Professional Credit Protective Bureau has proved very beneficial to many professional people who have adopted this excellent credit control and collection service.

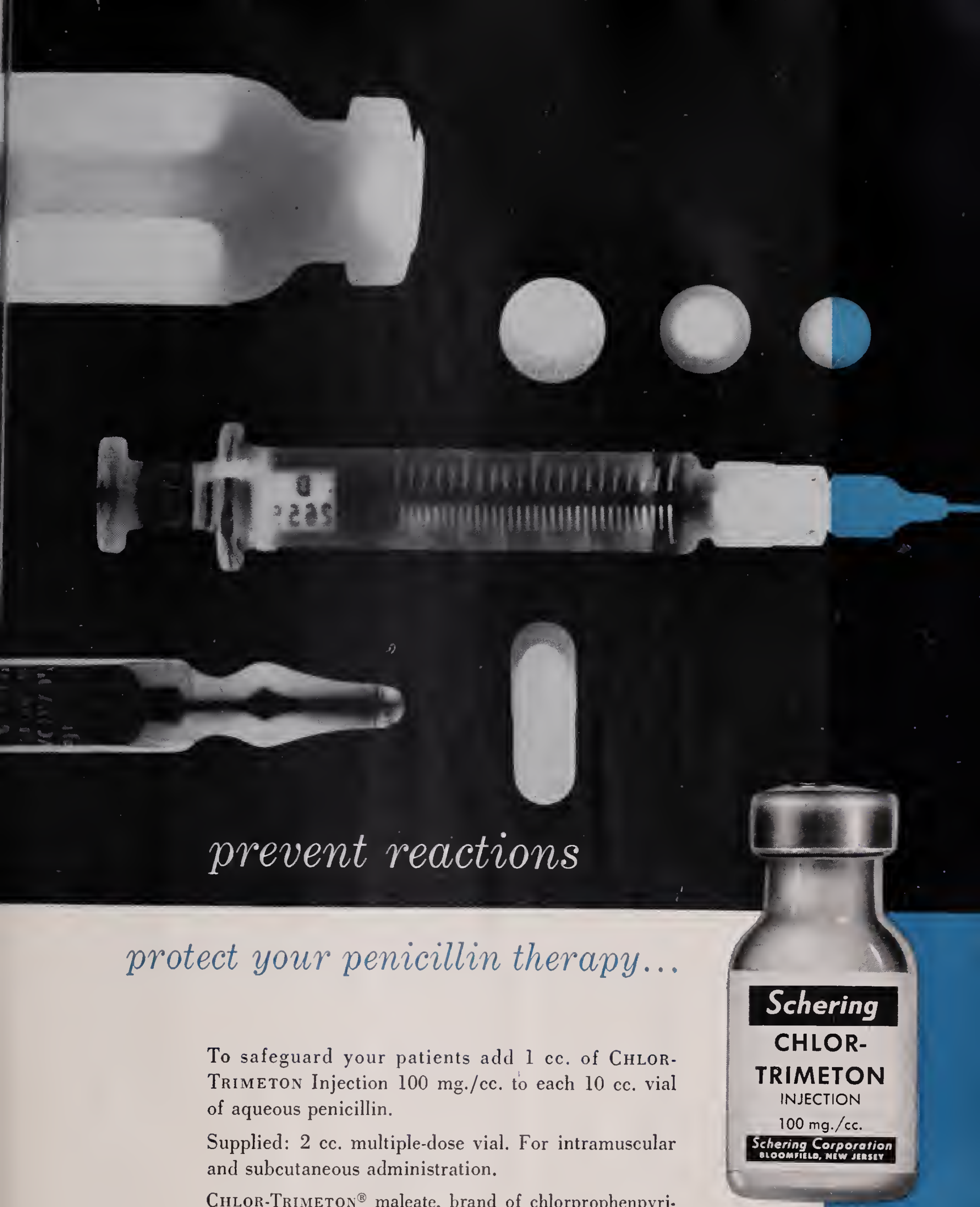
We urge you to make use of this service since it will be of great benefit in recovering long delinquent accounts and in eliminating, through proper control measures, the accumulation of slow and bad accounts.

Professional Credit Protective Bureau
701 Metropolitan Bldg., Minneapolis 1, Minn.

YES, I would like to give the PROFESSIONAL CREDIT PROTECTIVE BUREAU a trial. Please ask one of their representatives to call on me without obligation to explain the plan in detail.

NAME ....

ADDRESS ....


Schering
CHLOR-
TRIMETON
INJECTION
100 mg./cc.
Schering Corporation
BLOOMFIELD, NEW JERSEY

prevent reactions

protect your penicillin therapy...

To safeguard your patients add 1 cc. of CHLOR-TRIMETON Injection 100 mg./cc. to each 10 cc. vial of aqueous penicillin.

Supplied: 2 cc. multiple-dose vial. For intramuscular and subcutaneous administration.

CHLOR-TRIMETON® maleate, brand of chlorprophenpyridamine maleate.

CT-J-58

Crestview Hospital
SAINT PAUL

CRESTVIEW

Typical Semi-private Room

SAINT PAUL'S most complete, exclusive, NEUROPSYCHIATRIC HOSPITAL

Ultra modern facilities and comforts at the lowest cost to patients.

- Occupational therapy and recreational department.
- Complete X-ray and laboratory.
- Electrocardiography—basal metabolism.
- Electroencephalography available.
- All patients' rooms air-conditioned.
- Background music and psychotherapy sound equipment.
- Medically staffed by every neurologist and psychiatrist in Saint Paul.
- Especially trained nursing staff.

Send for photo booklet and rates.

APPROVED by the Minnesota State Medical Association and the Ramsey County Medical Society.

MEMBER of the American Hospital Association.

MEMBER of the Minnesota Hospital Association.

CRESTVIEW HOSPITAL, 145 W. College Ave., CApital 4-5841, St. Paul

A non-profit organization.

More for your ℞ Dollar . . . from BENSON

More . . .

. . . when you know that *every* ℞ — no matter how simple or complex — is thoroughly analyzed, every lens is checked, tested, and inspected over and over again before it leaves a BENSON laboratory . . . *at no additional cost.*

More . . .

. . . when you consider the quality of material BENSON puts into each prescription — whether it be a tough +20.00 sph. on a −15.00 cyl. in a bifocal, or simply a low compound. BENSON OPTICAL *has never used a second quality lens.*

And More . . .

. . . when you realize that 42 years of continuous BENSON research and study have brought the very latest improvements in modern ℞ methods into BENSON laboratories — designed, equipped, and staffed to meet the everyday, as well as special, needs of the most discriminating doctors dedicated to good eye care.

That's why the name "Benson" has come to stand for quality and precision in ophthalmic optical production.

We invite your inquiries.

Since 1913 Benson OPTICAL COMPANY Executive Offices • Minneapolis 2, Minn.

COMPLETE LABORATORIES CONVENIENTLY LOCATED IN UPPER MIDWEST CITIES

When in doubt about antibacterials —

With so many antibacterial drugs to choose from, you may wonder which one to prescribe. We believe you'll agree that most of them are rather good. Still, we hope you'll try Gantrisin® 'Roche'...because this single sulfonamide is soluble in both acid and alkaline urine... because it has a wide antibacterial spectrum... an impressive clinical background...and, above all, because it's so well tolerated by most patients.

for antibacterial
therapy without
"medicine taste"

the pure raspberry flavor of this convenient Gantrisin (acetyl) Pediatric Suspension 'Roche' is so appealing that youngsters accept each dose without balking. The acetyl form provides the same wide-spectrum effectiveness, high plasma and urine levels and virtual freedom from gastrointestinal upsets as other oral dosage forms of Gantrisin, a widely used single sulfonamide.

Gantrisin® acetyl -- brand of acetyl sulfisoxazole
Gantrisin® -- brand of sulfisoxazole
Hoffmann - La Roche Inc · Nutley · N.J.

new horizons...

...in antibiotic therapy are revealed by current reports on

Tetracyn® – Pfizer-discovered tetracycline

BRAND OF TETRACYCLINE

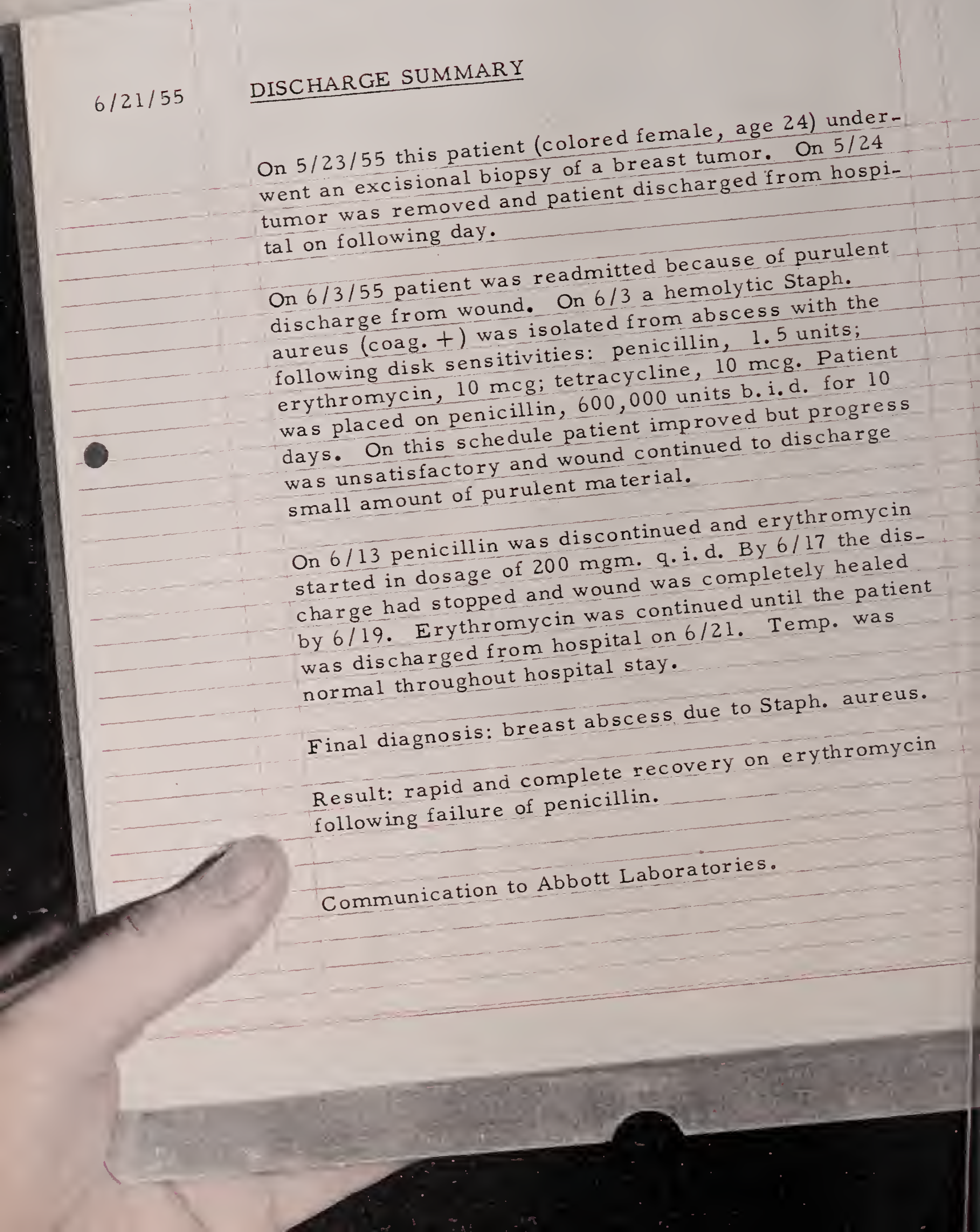
Tetracycline is notable among broad-spectrum antibiotics for its solubility and stability. And, clinical trials have established that tetracycline is an efficient antibiotic against those diseases due to susceptible microorganisms.

Tetracyn is available in a variety of oral, parenteral and topical dosage forms for the treatment of a wide range of susceptible infections.

Pfizer

PFIZER LABORATORIES
Division, Chas. Pfizer & Co., Inc.
Brooklyn 6, N.Y.

Erythromycin in treatment of abscess



6/21/55 DISCHARGE SUMMARY

On 5/23/55 this patient (colored female, age 24) underwent an excisional biopsy of a breast tumor. On 5/24 tumor was removed and patient discharged from hospital on following day.

On 6/3/55 patient was readmitted because of purulent discharge from wound. On 6/3 a hemolytic Staph. aureus (coag. +) was isolated from abscess with the following disk sensitivities: penicillin, 1.5 units; erythromycin, 10 mcg; tetracycline, 10 mcg. Patient was placed on penicillin, 600,000 units b.i.d. for 10 days. On this schedule patient improved but progress was unsatisfactory and wound continued to discharge small amount of purulent material.

On 6/13 penicillin was discontinued and erythromycin started in dosage of 200 mgm. q.i.d. By 6/17 the discharge had stopped and wound was completely healed by 6/19. Erythromycin was continued until the patient was discharged from hospital on 6/21. Temp. was normal throughout hospital stay.

Final diagnosis: breast abscess due to Staph. aureus.

Result: rapid and complete recovery on erythromycin following failure of penicillin.

Communication to Abbott Laboratories.

specific against coccic infections

Now, you can prescribe an antibiotic (*Filmtab* ERYTHROCIN) that provides *specific therapy* against staph-, strep- or pneumococci. Since these organisms cause most bacterial respiratory infections (and since they are the very organisms most sensitive to ERYTHROCIN) doesn't it make good sense to prescribe ERYTHROCIN when the infection is coccic?

filmtab®

Erythrocin®
(Erythromycin, Abbott)
STEARATE

with little risk of serious side effects

Since ERYTHROCIN is inactive against gram-negative organisms, it is less likely to alter intestinal flora—with an accompanying low incidence of side effects. Also, your patients seldom get the allergic reactions sometimes seen with penicillin. Or loss of accessory vitamins during ERYTHROCIN therapy. *Filmtab* ERYTHROCIN (100 and 250 mg.), bottles of 25 and 100.

Abbott

filmtab®

Erythrocin®
(Erythromycin, Abbott)
STEARATE

®Filmtab—Film sealed tablets; patent applied for.

601165

Affiliated with St. Croix Memorial Hospital
MEDICAL STAFF
Fred B. Reigel, M.D., *Chief of Staff*
J. C. Belshe, M.D., *Asst. Chief of Staff*
Norwood E. Wegner, M.D.

HELP FOR PROBLEM DRINKERS *

* The Problem Drinker is one whose drinking causes a continuing and growing problem in any department of his life.

IF YOU HAVE PATIENTS IN THIS CATEGORY . . . . INVESTIGATE!

Hazelden is a non-profit organization, designed to help problem drinkers return to normal living. Its peaceful country setting is on beautiful Lake Chisago, near Center City, 45 miles northeast of the Twin Cities, with spacious grounds, suitable and well-equipped buildings. Hazelden is secluded, yet within easy reach of U. S. Highway 8.

Your Inspection Is Invited.
Complete Information on Request.

Director
LYNN CARROLL

Hazelden

Twin Cities Office
341 North Dale Street - Saint Paul, Minn.
24 Hour Telephone—CApital 7-6397

CLINICAL REVIEWS

Mayo Clinic and Mayo Foundation

April 9, 10 and 11, 1956

Rochester, Minnesota

This 3-day program will be devoted to lectures and discussions on problems of current interest in general medicine and surgery. The presentations will be made by staff members of the Mayo Clinic and the Mayo Foundation for Medical Education and Research.

The number of physicians who can be accommodated is necessarily limited. Those wishing to attend should communicate with Mr. R. C. Roesler, Mayo Clinic, Rochester, Minnesota.

There are no fees of any kind.

Now Available

7 Years Sickness Benefits

(HOUSE CONFINEMENT NOT REQUIRED)

Lifetime Accident Benefits

This extension of benefits is now available to you as a member of the Minnesota State Medical Association. Since December, *1947,* the inception date of our plan for members of your Association, the Caswell-Ross Agency has attempted at all times to secure for you the finest coverage in the accident and sickness field. These improvements will make your policy the best among many available to you. An application has been sent to you previously—why not complete and return it to our office now.

CASWELL-ROSS AGENCY

1177 N. W. Bank Building
Minneapolis 2, Minnesota
Minneapolis—FE 2-2585
St. Paul—MI. 5-7004

Administrators of Professional Disability Plans

Minnesota State Bar Association
Minnesota State Dental Association
Minnesota State Medical Association
Minnesota Society of C. P. A.
Minnesota State Pharmaceutical Assn.
Minnesota Auto Dealers Association
Minnesota Federation of Eng. Societies
Minnesota State Veterinary Medical Soc.
Hennepin County Medical Society
Hennepin County Bar Association
11th Judicial Bar Association
Minneapolis Association of Life Underwriters
Minnesota State Life Underwriters Assn., Inc.
Ramsey County Medical Society
Ramsey County Bar Association
St. Paul District Dental Soc.
Minneapolis District Dental Soc.
St. Cloud Dental and Stearns County Medical Society
Duluth District Dental Society
East Central Medical Society
St. Louis County Medical Society
West Central Dist. Dental Society
Northwest Proprietors Association
St. Paul Life Underwriters, Inc.

PHOTO DATA. CAMERA: 4X5 REFLEX; EXPOSURE: 1/200 SEC. AT F.8 EXISTING LIGHTING.

ACHROMYCIN*

Hydrochloride

Tetracycline HCl *Lederle*

widely prescribed because of these important advantages:

1) rapid diffusion and penetration
2) prompt control of infection
3) negligible side effects
4) true broad-spectrum activity (proved effective against a wide variety of infections caused by Gram-positive and Gram-negative bacteria, rickettsiae, and certain viruses and protozoa)
5) every gram produced in Lederle's *own* laboratories under rigid quality control, and offered *only* under the Lederle label
6) a *complete* line of dosage forms

LEDERLE LABORATORIES DIVISION AMERICAN *Cyanamid* COMPANY PEARL RIVER, NEW YORK Lederle

*REG. U. S. PAT. OFF.

Upjohn
KALAMAZOO

Indicated wherever oral cortisone or hydrocortisone is effective • Available in 5 mg. tablets in bottles of 30 and 100, and in 1 mg. tablets in bottles of 100 • Usual dosage is ½ to 1 tablet three or four times daily

Delta-Cortef*

Fewer side effects at effective dosage levels

*Trademark for the Upjohn brand of prednisolone (delta-l-hydrocortisone)

ANNUAL CLINICAL CONFERENCE

Chicago Medical Society

February 28, 29, March 1 and 2, 1956

Palmer House, Chicago

DAILY HALF-HOUR LECTURES BY OUTSTANDING TEACHERS AND SPEAKERS on subjects of interest to both general practitioner and specialist

PANELS ON TIMELY TOPICS

TEACHING DEMONSTRATIONS

SCIENTIFIC EXHIBITS worthy of real study and helpful and time-saving TECHNICAL EXHIBITS.

The CHICAGO MEDICAL SOCIETY ANNUAL CLINICAL CONFERENCE should be a MUST on the calendar of every physician. Plan now to attend and make your reservation at the Palmer House.

Upjohn

Rheumatoid arthritis, rheumatic fever, intractable asthma, allergies . . .

Cortef* *tablets*

Supplied:

5 mg. tablets in bottles of 50
10 mg. tablets in bottles of 25, 100, 500
20 mg. tablets in bottles of 25, 100, 500

*REGISTERED TRADEMARK FOR THE UPJOHN
BRAND OF HYDROCORTISONE (COMPOUND F)

The Upjohn Company, Kalamazoo, Michigan

25 Compressed Tablets
Cortef*, 20 mg.
*TRADEMARK, REG. U.S. PAT. OFF.
Brand of hydrocortisone
Each tablet contains:
Caution: Federal law prohibits dispensing without prescription
Warning: This potent drug to be used only under the direction of a physician
Directions for use—See accompanying insert.
The Upjohn Company
Kalamazoo, Michigan

With "Premarin," relief of menopausal distress is prompt and the "sense of well-being" imparted is highly gratifying to the patient.

"Premarin"® —Conjugated Estrogens (equine)

5513

---

for a spastic
GUT

ABC-TV
MEDICAL HORIZONS TV Monday P.M.
Sponsored by CIBA

Trasentine®-Phenobarbital

integrated relief . . .
mild sedation
visceral spasmolysis
mucosal analgesia

TABLETS *(yellow, coated), each containing 50 mg. Trasentine® hydrochloride (adiphenine hydrochloride CIBA) and 20 mg. phenobarbital.*

C I B A
Summit, N. J.

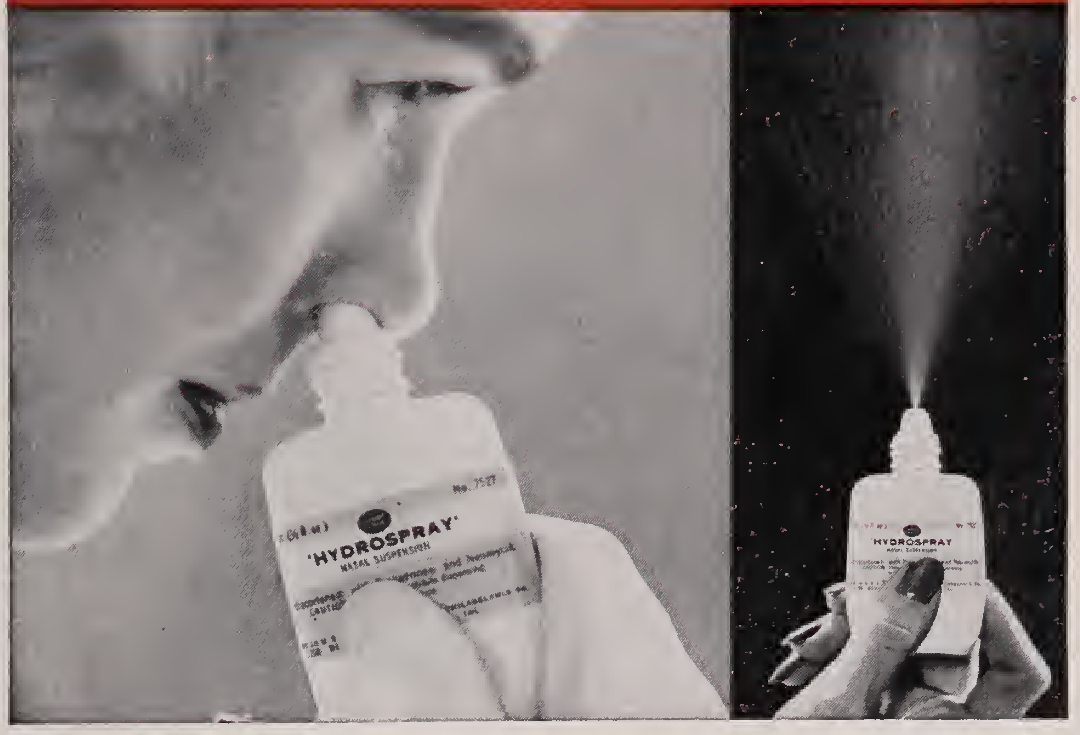
2/2228M

'Hydrospray' NASAL SUSPENSION

(HYDROCORTONE® WITH PROPADRINE® AND NEOMYCIN)

Anti-inflammatory—Decongestant—Antibacterial

MAJOR ADVANTAGES: New synergistic anti-inflammatory, decongestant and antibacterial formula. High steroid content assures effective response.



Topically applied hydrocortisone[1] in therapeutic concentrations has been shown to afford a significant degree of subjective and objective improvement in a high percentage of patients suffering from various types of rhinitis. HYDROSPRAY provides HYDROCORTONE in a concentration of 0.1% plus a safe but potent decongestant, PROPADRINE, and a wide-spectrum antibiotic, Neomycin, with low sensitization potential. This combination provides a three-fold attack on the physiologic and pathologic manifestations of nasal allergies which results in a degree of relief that is often greater and achieved faster than when any one of these agents is employed alone.

INDICATIONS: Acute and chronic rhinitis, vasomotor rhinitis, perennial rhinitis and polyposis.

SUPPLIED: In squeezable plastic spray bottles containing 15 cc. HYDROSPRAY, each cc. supplying 1 mg. of HYDROCORTONE, 15 mg. of PROPADRINE Hydrochloride and 5 mg. of Neomycin Sulfate (equivalent to 3.5 mg. of neomycin base).

SHARP & DOHME
Philadelphia 1, Pa.
DIVISION OF MERCK & CO., INC.

REFERENCE: 1. Silcox, L. E., *A.M.A. Arch. Otolaryng.* 60:431. Oct. 1954.

New STEELINE Pediatric Table

Eases the burden of the physician's daily work

Includes built-in tare balance scale, built-in measuring rod, foam rubber cushion and electrical outlets with cord and plug—there are no accessories to buy. Top quality construction features include all-welded steel body, two roomy drawers and a large open compartment with shelf, providing easy, unhampered access to instruments and supplies. Front edge is protected from wear by a stainless steel baffle plate. Despite the fact that this new table has been designed to provide the physician with the best modern equipment, efficient modern production methods in our own factory permit us to keep the price well below that of comparable models. Write today for complete information.

a. s. aloe company OF MINNESOTA
927 Portland Avenue, Minneapolis 4, Minn. • Phone: FEderal 8-7601

Brown & Day, Inc.

PICKER CENTURY X-RAY UNIT

A New Model of the World's Most Popular 100 MA. Machine

★

- NEW Anatomic Control
- NEW Smooth Appearance
- NO Technique Chart
- SAME Low Depreciation

★

See us for appraisal of your present unit

"Everything for the Physician"

for fast service call CA 2-1845

SERVICE BROWN & DAY INC. SAINT PAUL U.S.A. QUALITY

62-64 EAST 5TH ST
St. Paul 1, Minn.

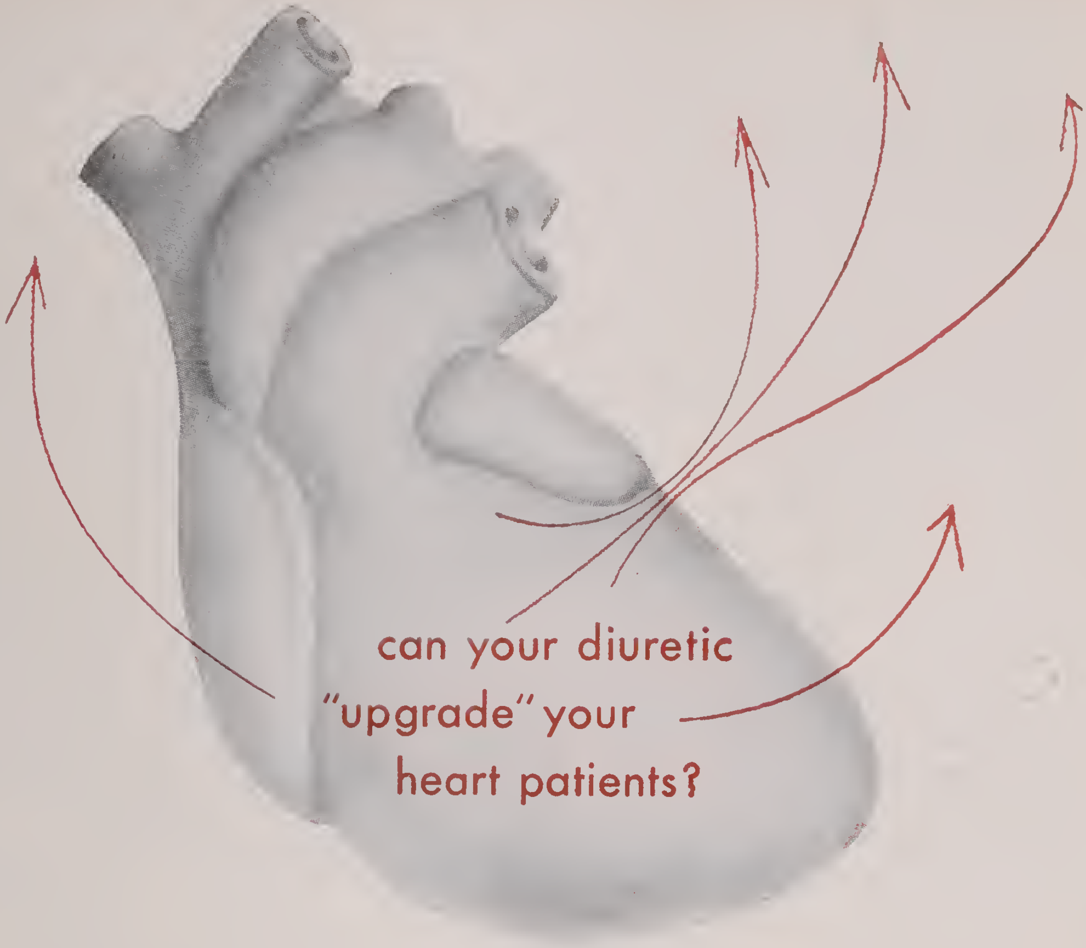
Cook County Graduate School of Medicine

INTENSIVE POSTGRADUATE COURSES
STARTING DATES—WINTER-SPRING, 1956

SURGERY—Surgical Technic, two weeks, February 6, February 20
Surgical Anatomy and Clinical Surgery, two weeks, March 5
Surgery of Colon and Rectum, one week, February 27, April 9
General Surgery, one week, February 13, two weeks, April 23
Basic Principles in General Surgery, two weeks, April 9
Gallbladder Surgery, ten hours, April 9
Fractures and Traumatic Surgery, two weeks, March 12
GYNECOLOGY—Office and Operative Gynecology, two weeks, February 13, March 12
Vaginal Approach to Pelvic Surgery, one week, February 6, March 5
OBSTETRICS—General and Surgical Obstetrics, two weeks, February 27, March 26
MEDICINE—Internal Medicine, two weeks, May 7
Electrocardiography and Heart Disease, two week basic course, March 12
Gastroscopy, forty-hour course, March 19
Dermatology, two weeks, May 7
RADIOLOGY—Diagnostic X-Ray, two weeks, February 6, April 30
Clinical Use of Radioactive Iodine, one week, April 2
Clinical Uses of Radioisotopes, two weeks, May 7
PEDIATRICS—Intensive Review Course, two weeks, May 14
Neurological Diseases: Cerebral Palsy, two weeks, June 18
UROLOGY—Two-week Course, April 16
Cystoscopy, ten days, by appointment

TEACHING FACULTY—ATTENDING STAFF
OF COOK COUNTY HOSPITAL

ADDRESS: REGISTRAR, 707 South Wood Street,
Chicago 12, Illinois



know your diuretic

fewer restrictions of activity are the benefit of prolonged use of those diuretics effective over the entire range of cardiac failure. The organomercurials—parenteral and oral—improve the classification and prognosis of your decompensated patients. Diuretics of value only in milder grades of failure, or which must be given intermittently because of refractoriness or side effects, are incapable of "upgrading" the cardiac patient.

TABLET

NEOHYDRIN®

BRAND OF CHLORMERODRIN

(18.3 MG. OF 3-CHLOROMERCURI-2-METHOXY-PROPYLUREA IN EACH TABLET)

for "...a new picture of the patient in congestive heart failure."*
replaces injections in 80% to 90% of patients

*Leff, W., and Nussbaum, H. E.: J. M. Soc. New Jersey 50:149, 1953.

a standard for initial control of severe failure

MERCUHYDRIN® SODIUM
BRAND OF MERALLURIDE INJECTION

Leadership in diuretic research
Lakeside LABORATORIES, INC., MILWAUKEE 1, WISCONSIN

60055

A MODERN
PRIVATE
SANITARIUM

for the Diagnosis, Care and Treatment of Nervous and Mental Disorders

MAIN BUILDING—One of 10 Units in "Cottage Plan"

ST. CROIXDALE ON LAKE ST. CROIX

PRESCOTT, WISCONSIN

Located on beautiful Lake St. Croix, 18 miles from the Twin Cities, it has the advantages of both City and Country. Every facility for treatment provided, including recreational activities and occupational-therapy under trained personnel. Close personal supervision given patients, and modern methods of therapy employed. Inspection and cooperation by reputable physicians invited. Rates very reasonable. Illustrated folder on request.

Prescott Office
Prescott, Wisconsin
Howard J. Laney, M.D.
Tel. 39 and Res., 76

Consulting Neuro-Psychiatrists
Hewitt B. Hannah, M.D., Andrew J. Leemhuis, M.D.
527 Medical Arts Bldg., Tel. MAin 1357, Minneapolis, Minn.

Superintendent
Ella M. Leseman
Prescott, Wisconsin
Tel. 69

NEW!
Patented HANSEN
Split Frame Truss

Positive Hernia Control

Contoured Spring Design Gives
Custom Made Comfort
Unlimited Body Activity

Single with Dummy illustrated
Double not illustrated

C. F. ANDERSON CO., INC.

901 Marquette
Minneapolis, Minnesota

THE
MEDICAL PROTECTIVE
COMPANY
FORT WAYNE, INDIANA

unique
in successfully fighting
malpractice charges

PROFESSIONAL PROTECTION
EXCLUSIVELY
SINCE 1899

MINNEAPOLIS Office:
Robert L. McFerran, Rep.,
311 East 24th St., Apt. A-1
Telephone Federal 9-1292
Donald D. Martin, Rep.,
318 E. 25th St., Apt. D-8
Telephone Federal 6-8751

NOW IN TWO POTENCIES

for more precise dosage

NEW 1 mg. *pink* tablet | 5 mg. tablet

MOST POTENT
ANTI-RHEUMATIC

Sterane*

Both tablets are deep-scored and of the **SAME DISTINCTIVE "FINGER-GRIP" SIZE AND SHAPE** for ease of handling and breaking by arthritic fingers.

anti-rheumatic/anti-allergic/anti-inflammatory

supplied: **Pink,** 1 mg. oral tablets, bottles of 100.
White, 5 mg. oral tablets, bottles of 20 and 100.

PFIZER LABORATORIES
Division, Chas. Pfizer & Co., Inc.
Brooklyn 6, New York

*brand of prednisolone

METICORTEN*

PREDNISONE, SCHERING (metacortandracin)

THE DISTINCTIVE BENEFITS OF HORMONE THERAPY

WITH MORE ASSURANCE OF SAFETY

For physicians who hesitate to use the older corticosteroids because of diminishing therapeutic returns and frequently predominating major undesirable side effects, METICORTEN with its high therapeutic ratio reduces the incidence of certain major undesirable side effects.

- minimizes sodium and water retention
- minimizes weight gain due to edema
- no excessive potassium depletion
- in rheumatoid arthritis, effective relief of pain, swelling, tenderness; diminishes joint stiffness
- in intractable asthma, relief of bronchospasm, dyspnea, cough; increases vital capacity
- clinical response even where cortisone or hydrocortisone ceases to be effective—"cortisone escape"
- effective in smaller dosage

BIBLIOGRAPHY

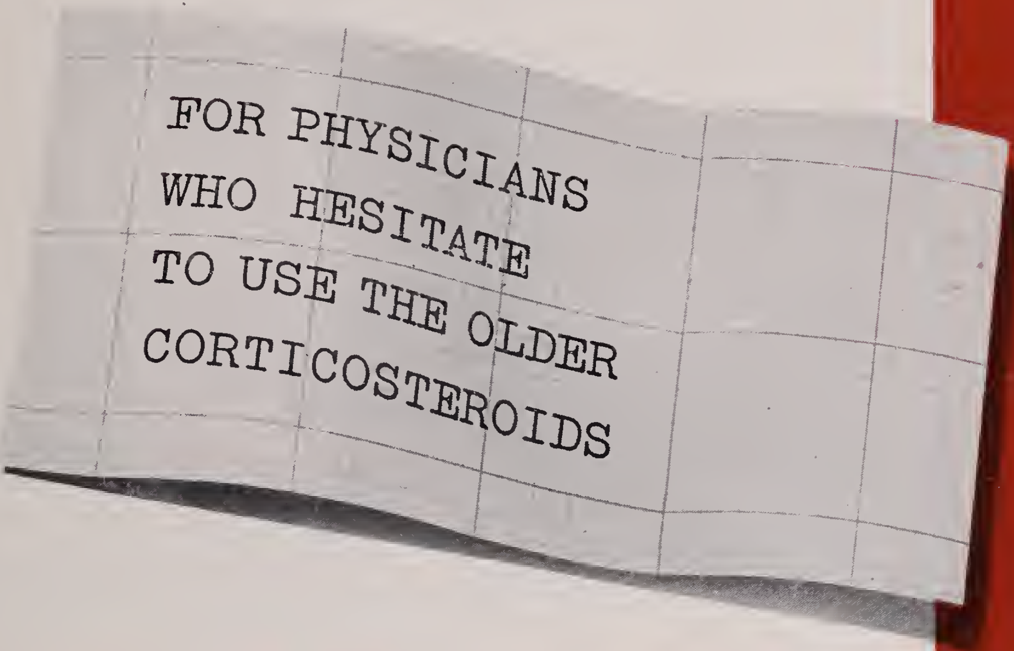
(1) Bunim, J. J.; Pechet, M. M., and Bollet, A. J.: J.A.M.A. *157*:311, 1955. (2) Gray, J. W., and Merrick, E. Z.: J. Am. Geriat. Soc. *3*:337, 1955. (3) Boland, E. W.: California Med. *82*:65, 1955. (4) Dordick, J. R., and Gluck, E. J.: J.A.M.A. *158*:166, 1955. (5) Margolis, H. M., and others: J.A.M.A. *158*:454, 1955. (6) Hollander, J. L.: Philadelphia Med. *50*:1357, 1955. (7) Barach, A. L.; Bickerman, H. A., and Beck, G. J.: Dis. Chest *27*:515, 1955. (8) Arbesman, C. E., and Ehrenreich, R. J.: J. Allergy *26*:189, 1955. (9) Skaggs, J. T.; Bernstein, J., and Cooke, R. A.: J. Allergy *26*:201, 1955. (10) Schwartz, E.: J. Allergy *26*:206, 1955. (11) Nelson, C. T.: J. Invest. Dermat. *24*:377, 1955. (12) Robinson, H. M., Jr.: J.A.M.A. *158*:473, 1955. (13) Herzog, H. L., and others: Science *121*:176, 1955. (14) Perlman, P. L., and Tolksdorf, S.: Fed. Proc. *14*:377, 1955. (15) King, J. H., and Weimer, J. R.: Experimental and clinical studies on Meticorten (prednisone) and Meticortelone (prednisolone) in ophthalmology, A.M.A. Arch. Ophth., in press. (16) Barach, A. L.; Bickerman, H. A., and Beck, G. J.: Clinical and physiological studies on the use of metacortandracin in respiratory disease. II. Pulmonary emphysema and pulmonary fibrosis, Dis. Chest, to be published. (17) Dordick, J. R., and Gluck, E. J.: Preliminary clinical trials with prednisone (Meticorten) in systemic lupus erythematosus, A.M.A. Arch. Dermat. & Syph., in press. (18) Goldman, L.; Flatt, R., and Baskett, J.: Assay technics for local anti-inflammatory activity in the skin of man with prednisone (Meticorten) and prednisolone (Meticortelone), J. Invest. Dermat., in press.

METICORTEN,* brand of prednisone.
*T.M.

in

rheumatoid arthritis,

intractable asthma, rheumatic fever, nephrosis, certain skin disorders such as acute disseminated lupus erythematosus, acute pemphigus, extensive atopic dermatitis and other allergic dermatoses, and certain eye disorders



FOR PHYSICIANS
WHO HESITATE
TO USE THE OLDER
CORTICOSTEROIDS

METICORTEN

PREDNISONE, SCHERING (metacortandracin)

SCHERING CORPORATION BLOOMFIELD, NEW JERSEY

Schering

MC-J-520

Provides complete control of digitalis dose
Lilly
QUALITY / RESEARCH / INTEGRITY

'Crystodigin'

(CRYSTALLINE DIGITOXIN, LILLY)

. . . . permits accurate dosage titration to produce the maximum therapeutic effect

Since initial digitalization and maintenance dosage must be carefully individualized, 'Crystodigin' fulfills the important requirements of a preferred digitalis. 'Crystodigin' is a crystalline-pure, uniformly potent single glycoside that is completely absorbed in the gastro-intestinal tract. With 'Crystodigin,' the maximum therapeutic effect can be safely determined by dosage titration in increments as small as 0.025 mg.

Available in scored tablets of 0.05 mg. (orange), 0.1 mg. (pink), 0.15 mg. (yellow), and 0.2 mg. (white); and in 1-cc. and 10-cc. ampoules, 0.2 mg. per cc.

ELI LILLY AND COMPANY • INDIANAPOLIS 6, INDIANA, U.S.A.

666000

Original Contributions

Surgical Treatment of Certain Congenital Cardiovascular Abnormalities in Infants and Children

PHILIP E. BERNATZ, M.D.,
JAMES W. DUSHANE, M.D.,
and JOHN W. KIRKLIN, M.D.
Rochester, Minnesota

IT is a universal human desire to insure the survival of children and enable them to progress normally to adulthood. It is unfortunate that the ravages of congenital heart disease have oftentimes prevented such a sequence of events. Until recent years, the physician's participation in the care of these children was necessarily directed toward palliation of symptoms and, in many cases, the accomplishment of even this palliation was accompanied by costly, recurrent hospitalization. Surgical correction of cardiovascular defects has changed the outlook for many of these youngsters from one of chronic illness to one of normal existence. We are deeply indebted to early investigators too numerous to mention, but special impetus has been given this surgery by men and women such as Gross, Crafoord, Brock, Potts, Taussig, Blalock, Lewis, Lillehei and Varco. Accomplishments in our institution and in others have been the result of remarkable co-operative enterprise stimulated by gratifying successes, but probably even more by repeated failures and apparently insoluble frustrations. Such integrated investigation has made it possible for us to speak to you about the successful surgical treatment of certain types of congenital heart disease in infants and children.

Report of Cases

The following cases illustrate causes for cardiac disability in infancy and childhood with some of the events leading to their surgical correction and return of these youngsters to a normal life.

Case 1.—After an uncomplicated prenatal course and delivery, this infant, who weighed 8 pounds, 4 ounces, at birth, was noted to breathe rapidly and to have tachycardia. The examining physician could not hear any heart murmur. X-ray examination of the thorax revealed cardiac enlargement. The child was lethargic and a persistent cough had developed. The family history was noncontributory. When seen at the Mayo Clinic, at the age of two and one-half months, the infant was noted to be well developed, without cyanosis but with a respiratory rate of 70 per minute and tachycardia measuring 168 per minute. The heart was enlarged; a palpable thrill was noted over the precordium and a systolic murmur maximal in the left fourth interspace. The second pulmonic sound was accentuated; femoral pulsations were good, and the electrocardiogram suggested biventricular hypertrophy. An x-ray examination of the thorax showed cardiac enlargement. The results of urinalysis were normal. The value for hemoglobin was 9.7 gm. per 100 cc. of blood and the results of other blood studies were normal.

Digitalization of the child resulted in partial abatement of the symptoms of congestive heart failure. Cardiac catheterization studies were done and revealed greatly elevated pressures in the right ventricle and pulmonary artery. A striking increase in oxygen content of blood from the pulmonary artery over that from the right ventricle was noted. Arterial oxygen studies gave normal results. On the basis of these studies a patent ductus arteriosus with a large shunt was concluded to be responsible for the child's congestive heart failure and surgical closure of the patent vessel was advised. At the time of operation, the diameter of the short patent ductus arteriosus exceeded that of the aorta, but division and closure were accomplished without incident.

The infant's postoperative course was uncomplicated. Cardiac enlargement receded and the administration of digitalis was discontinued after two weeks. The baby was recently seen at the age of one year, at which time he was noted to be a big, healthy child. Murmurs were not

---

Read at the meeting of the Southern Minnesota Medical Association, Albert Lea, Minnesota, September 12, 1955.

From the Section of Surgery and the Section of Pediatrics, Mayo Clinic and Mayo Foundation, Rochester, Minnesota.

The Mayo Foundation is a part of the Graduate School of the University of Minnesota.

heard and the size of the heart at this time was considered normal. This child now has a completely normal cardiovascular system and normal life expectancy.

Comment.—We are indebted to Gross for his successful closure of a patent ductus arteriosus in 1939. The case we have just presented is interesting in that congestive heart failure had developed within the first few weeks of the infant's life. A patent ductus is often well tolerated in childhood, but usually causes progressive trouble in ensuing years. The diagnosis of this abnormality may be relatively easy when the classical clinical picture is present. As in the case presented, however, the picture may be confusing and will tax the diagnostic acumen of all concerned with the problem. This infant presented a problem of congestive heart failure in the early weeks of life. We have learned that common causes of such a disability include patent ductus arteriosus, coarctation of the aorta, fetal endocardial sclerosis, ventricular septal defect and, rarely, atrial septal defect. We must always weigh carefully our plans for complicated diagnostic studies because even these carry some risk in these sick children. However, now that many congenital cardiovascular defects can be cured by surgical measures, and since the operative technic varies with each case, it is extremely important that an accurate preoperative assessment be made. Although cardiac catheterization studies are not necessary in most patients with patent ductus arteriosus, this case illustrates how valuable such studies can be. In addition to furnishing accurate information about location and size of shunts, such studies alert the surgeon to the presence of other abnormalities. For these reasons, the risk of cardiac catheterization in these sick infants can be justifiably assumed.

The surgical treatment of patent ductus arteriosus is very satisfactory. Ideally, surgeons prefer to operate on these patients when they are between the ages of three and ten years but, as in this child, indication for operation may be compelling at any time after birth. The results of such surgical treatment are extremely gratifying. Under ordinary circumstances, closure of the patent vessel can be accomplished with a risk of 2 per cent and we would recommend operation in practically all situations.

Case 2.—The mother of a girl who was first seen at the clinic at the age of six years stated that the child had been known to have a heart murmur since the age of six months. She was always behind the other children of her age, tired easily and had had intermittent bouts of fever but no cyanosis. For the next five years the child was seen at intervals and, except for some shortness of breath on exertion and intermittent bouts of fever, she made fairly satisfactory progress. She was, however, a very small, thin little girl. Cardiac catheterization was done at the age of ten years and these studies confirmed the presence of an atrial septal defect. It was concluded from the dye curves and saturation data that there was a left-to-right shunt of about 50 per cent of the child's blood flow. The roentgenogram of the thorax revealed cardiac enlargement and a shadow cast by a prominent pulmonary artery. Because of the cardiac enlargement, large shunt of blood flow and the presence of symptoms, closure of the atrial septal defect was advised. Surgical exploration revealed an atrial septal defect approximately 4 by 2 cm. in size. Though present in other regions, there was no septal remnant in the vicinity of the inferior vena cava orifice. The defect was closed, with a piece of polyvinyl-formal sponge (ivalon sponge), the exposure being by the atrial well technic proposed by Gross. The child's postoperative course was uneventful and when she was seen a year later she had gained 39 pounds and her exercise tolerance was normal. No murmur was heard and her general examination revealed nothing abnormal. Cardiac catheterization studies were reported 10 weeks postoperatively and indicated a normal cardiovascular system.

Comment.—Atrial septal defects are among the commonest congenital abnormalities of the heart. In 1875, Rokitansky presented a description of the types of atrial septal defects and provided a challenge for subsequent embryologic research. Through the years, any attempt to describe accurately the anatomic variations of these interatrial communications has been considered to be of academic interest only. As illustrated by the case we have just presented, however, operative repair of atrial septal defects is feasible and the problems of surgical repair demand a precise knowledge of the anatomic variants of interatrial communications. A classification of these communications has been presented previously,[1] but we would like to emphasize that the defect may involve any part of the interatrial septum. Depending on its size and position, there may or may not be a complete septal rim around the defect. Associated abnormalities of the heart may be present and common among these are congenital anomalous pulmonary venous connections of the lungs.

The diagnosis of an interatrial communication may be made on clinical grounds. However, study by cardiac catheterization is indicated for all patients whose condition is so diagnosed and who are being considered for operation, to aid in localization of the defect and in calculation of the total blood flow passing through the shunt. Associated anomalies of the heart also may be noted.

In the early phases of our surgical experience with this malformation, we advised operation only for patients with significant disability. Experience has shown the risk of operation to be surprisingly low, and in our series of 60 patients with atrial septal defects and left-to-right shunts who underwent operation, there have been three deaths, a mortality rate of 5 per cent. The results of closure of these defects are often dramatic.

At present, the evidence suggests strongly that the risk of operation is much less than the risk of keeping an atrial septal defect. For this reason, we advise operation in most cases.

Case 3.—A boy first seen at the clinic at the age of four years had been known to have a heart murmur since birth. He had always been dyspneic on slightest exertion and complained of frequent pains in his thorax. Cyanosis had never been noted. He could not keep up with other children and preferred games in which he could remain sitting. At the time of examination the boy was noted to be slender and pale. He was 42 inches tall and weighed 33 pounds. Precordial thrill was noted in the second interspace on the left and cardiac enlargement was demonstrated. A harsh, loud systolic murmur was heard in the pulmonic area. The second pulmonic sound was not audible. Along the left sternal border a diastolic murmur was heard which was not continuous with the systolic murmur. Peripheral arterial pulsations were normal. An electrocardiogram revealed right bundle-branch block and left ventricular hypertrophy. X-ray examination of the thorax showed evidence of a large heart with prominent pulmonary trunk segment and some increase in pulmonary markings. Cardiac catheterization was carried out and indicated the presence of pulmonary stenosis and ventricular septal defect. The right ventricular pressure was very high, approximately equal to the systemic pressure, but the shunt of blood flow was from left ventricle to right ventricle.

At operation a typical poststenotic dilation of the pulmonary artery was noted. The stenosed pulmonary valve could be felt through the wall of the pulmonary artery. A strong thrill was noted over the right ventricle. The child's circulation was then taken over by the extracorporeal pump-oxygenator system (Gibbon type). Through a right ventriculotomy incision, a very high ventricular septal defect, measuring about 2 by 1.2 cm., was found. The lesion was so high that it was considered most likely to be a form of partial, persistent, common atrioventricular canal with minimal involvement of the atrial septum. The ventricular defect was closed by means of a small piece of compressed ivalon sponge. The stenosed pulmonary valve was then opened under direct vision. The child tolerated the surgical procedure well and his postoperative course was satisfactory.

The child was seen three months after operation, at which time he had gained 4 pounds. His heart rate was 80. The parents had noticed a striking change in the boy in that he was very active, was happy and participated in the activities of the neighborhood.

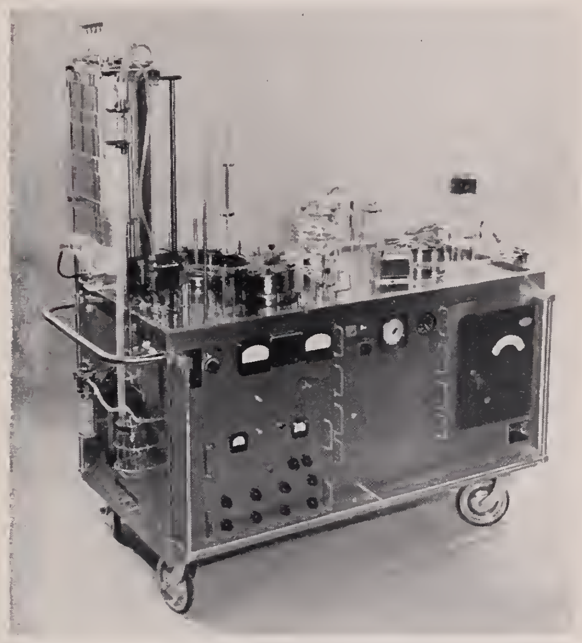


Fig. 1. The mechanical pump-oxygenator apparatus (Gibbon type) for temporary exclusion of the heart from the circulation.

Comment.—For many years it has been the dream of surgeons to be able to visualize intracardiac structures for a sufficient time to permit precise surgical correction of an abnormality, and a variety of methods have been utilized to attain this goal. Cases similar to the one just presented have furnished an urgent need for such surgical technique. The management of this patient with a ventricular septal defect is representative of a method of functional exclusion of the heart and lungs from the circulation of the patient, by means of a mechanical pump-oxygenator system. Other techniques of attaining this end have been employed by other investigators. We have been very pleased with the pump-oxygenator system of the Gibbon type (Figs. 1 and 2) and our clinical experience has been limited to this technique.

At the time this paper was written, twenty-six patients had been operated on by utilizing an extracorporeal circulation of the type described, and fourteen of them were patients with ventricular septal defect. Patients offered this operation to date have been those with symptoms of such severity that their prognosis was considered poor without surgical intervention. During the operative procedures the condition of the patients has been well maintained throughout the period of extracorporeal circulation. As a result, the ventricular septal defects have been visualized and accurately closed in an unhurried and precise manner. Of the fourteen patients with ventricular septal defect on whom this operative technique was used, ten are alive and well. Four patients have died in the postoperative period, but in no case could death be attributed directly to the period or method of perfusion. Actually, postoperative pulmonary complications have been present in all four cases in which death occurred and probably are related to the severe pulmonary hypertension that existed prior to operation.

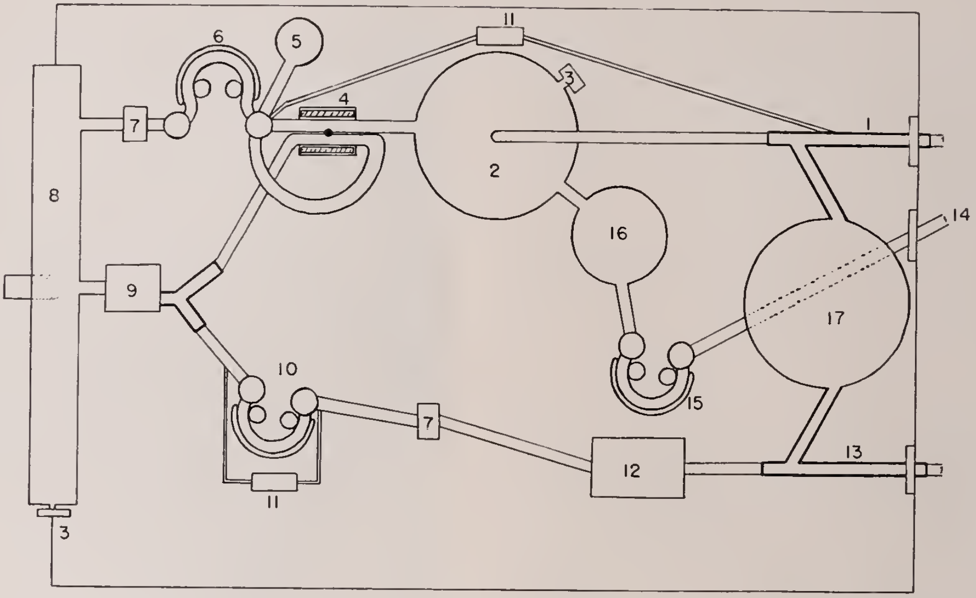


Fig. 2. Schematic representation of the pump-oxygenator system; (1) the venous-inflow line; (2) the venous reservoir; (3) level-sensing devices; (4) occluder; (5) input for the administration of blood and fluids; (6) recirculation pump; (7) high-pressure stops; (8) oxygenator; (9) holder for pH electrodes; (10) artery pump; (11) arterial and venous cuvette oximeter; (12) arterial filter; (13) arterial output to animal; (14) coronary-sinus inflow; (15) coronary-sinus pump; (16) coronary-sinus reservoir; (17) priming reservoir.

These surgical successes have demonstrated the value of the technique in which the pump-oxygenator apparatus is used for the treatment of certain cardiovascular abnormalities. This technique, which permits precise, unhurried intracardiac operation, is another valuable weapon for our attack on congenital heart disease. The risk imposed on the patient under these conditions has been reasonable and has encouraged the use of the technique in a greater variety of abnormalities of the heart and great vessels.

Summary

Patent ductus arteriosus, atrial septal defect and ventricular septal defect are three commonly encountered problems in the management of congenital heart disease in infancy and childhood. The evolution of surgical techniques has made it mandatory that accurate preoperative assessment of the defects be accomplished, and clinical evaluation plus cardiac catheterization studies have provided the surgeon with just such information. With early recognition and surgical treatment, the outlook for infants and children with certain abnormalities of the heart and great vessels has changed from that of chronic illness and recurrent hospitalization with short survival to that of normal life. The use of the extracorporeal pump-oxygenator system in a functional bypass of the heart and lungs enables us to attain that normal existence for more of these children. However, there undoubtedly will continue to be a place for the use of closed and semiopen surgical techniques in the treatment for certain cardiovascular abnormalities.

Reference

1. Kirklin, J. W., Swan, H. J. C., Wood, E. H., Burchell, H. B. and Edwards, J. E.: Anatomic, physiologic, and surgical considerations in repair of interatrial communications in man. J. Thoracic Surg., 29:37-49 (Jan.) 1955.

Causal and Preventive Aspects of Environmental Cancer

W. C. HUEPER, M.D.
Bethesda, Maryland

THE RAPID GROWTH and diversification of industrial activities and products have created during recent decades many new health hazards to producers and consumers, as well as to workers and the general public through occupational and environmental contact with industrial raw products, semifinished and finished goods, and waste products. Industrial and industry-related environmental cancers form an increasingly important segment of this new, artificial disease panorama associated with modern industrialism.

Industrial management and medicine have rather readily responded to the challenge of the relatively obvious acute and chronic toxic aspects of these new developments. They have been, on the other hand, much slower for various reasons in properly appreciating the serious nature and wide scope of the occupational and environmental cancer hazards also connected with industrialization.

General Considerations

A critical analysis of the general principles and special aspects of industry-related cancer-producing agents and cancers may, therefore, be helpful in placing this important problem into proper focus and in providing a constructive approach to a fuller understanding and awareness of and a more active interest in these health hazards which directly or indirectly concern not only industry proper but also industrialized human society as a whole. Industrial cancer hazards tend to spread from basic industries through processing and consuming industries to the general consumer, and may extend to the general population through the medium of environmental pollution of the air, water and soil with industrial wastes and environmental poisons possessing carcinogenic properties.

The discovery of an actual or even of a potential cancer hazard in an industrial establishment produces a serious and not infrequently costly problem to all branches of industrial management. The variety of aspects which arise and demand attention are summarized in Table I.

In addition to the various practical considerations and obligations which arise for industrial management from the discovery of an industrial cancer hazard, there ensue also definite moral duties toward the individuals who become exposed to carcinogenic material within or without the plant area. These are predicated on the fact that industry, like any other part of civilized human society, does not operate in a sociologic vacuum or as a self-contained entity but is an integral and interdependent part of modern mankind. Occupational cancer hazards and cancers, therefore, cannot be considered the sole concern of industrial management, while industry-related environmental cancers are definitely community, if not national, problems of public health.

This concept is based on the following factual evidence which clearly shows the medical-public health as well as economic implications of the existing situation. The number of reported cases of occupational cancers is considerably below the number of cases which have actually occurred. In fact, the great majority of occupational cancers which have occurred during the last two decades in American industries have not been made a matter of public record (Table II). To the number of recognized but unreported cases of occupational cancer must be added the not inconsiderable number of cases whose industrial origin remained for some reason obscure. To this group of occupational cancers doubtlessly belong almost all lesions which affected workers who were once employed and effectively exposed in a carcinogenic operation and in whom cancer developed after a latent period of many years while working for another employer and usually in a noncarcinogenic operation. Since the

---

From the National Cancer Institute, National Institute of Health, Public Health Service, U. S. Department of Health, Education and Welfare.

TABLE I. INDUSTRIAL MANAGEMENT AND INDUSTRIAL CANCER PROBLEMS

MEDICAL ASPECTS	TECHNOLOGIC ASPECTS	ECONOMIC ASPECTS	ADMINISTRATIVE ASPECTS
1. *Industrial medical aspects* related to the diagnosis, therapy and prevention of industrial cancers and the discovery of occupational carcinogens and carcinogenic operations; organization of a comprehensive medical record system listing precancerous and cancerous manifestations, and the type and duration of employment of all employes; institution of periodic medical examinations of the proper types for all employes coming directly or indirectly in contact with recognized or suspected occupational carcinogens and/or working continuously or intermittently in carcinogenic operations. 2. *General medical aspects* created by environmental pollution and sale of carcinogenic products and their transportation for noncompany handlers, consumers, neighborhood population and general public. 3. *Medicolegal aspects* associated with compensation claims from within and without the industrial concern for the causation or aggravation of cancers by industrial agents. 4. *Medical research* into the etiology, exposure conditions, diagnosis, therapy and prevention of occupational cancers; development of biologic screening methods for industrial carcinogen.	1. *Chemical-engineering efforts* for the development of safe production, handling, packaging and shipping of carcinogenic materials. 2. *Sanitary-engineering efforts* for the institution, competent use and strict observation of preventive, protective and prophylactic measures, the maintenance of safety equipment, the safe disposal of carcinogenic wastes, the observation of special precautions during repair and maintenance work and control of accidental contamination of the plant area with carcinogenic material. 3. *Periodic or continuous determination* of the presence and concentration of carcinogenic material in the workrooms and plant area: monitoring of workers for carcinogenic contacts. 4. *Research for the identification and determination* of occupational carcinogens, their inactivation and elimination by the devlopment of suitable substitutes of noncarcinogenic nature, development of practicable chemical and/or physical methods for the routine screening of products for the presence of carcinogenic agents.	1. *Determination of policy* regarding promotion, advertising, labeling and sale of products containing carcinogenic agents or of mechanical devices generating them when properly or improperly used. 2. *Establishment of policies* of duration of employment in carcinogenic operations, of continuation of employment of workers in such operations after the development of precancerous or cancerous lesions (measures influencing rate of labor turnover and productivity). 3. *Consideration of competitive sales position* in the light of increased production costs, compensation and medical expenses, and customers' resistance to properly labeled products.	1. *Establishment of suitable relations* to employes and labor organizations as to information on cancer hazards and their control, medical and hospital expenses incurred, disability caused, fatalities produced, hazard wages, compensation claims, observation of safety measures. 2. *Maintenance of co-operative relations* with and reporting to governmental health and labor authorities, compensation boards and interstate commerce agencies on industrial-cancer hazards and industrial-cancer cases. 3. *Processing of compensation claims* for damage to human health, livestock, crops, real property of employees, customers, and residents of the waste-disposal zone by carcinogenic matter; attention to violations of ordinances, regulations and laws pertaining to industrial health and labor standards on occupational and environmental carcinogenic hazards; consideration of legislative measures regarding the control of such hazards and their liability. 4. *Handling of public relations* on industrial carcinogens and cancers with newspapers, magazines, radio and television, as well as through the commercial information service with the general public.

TABLE II. OCCUPATIONAL CANCERS RECORDED IN THE UNITED STATES AND FOREIGN COUNTRIES

Up to 1952 (W. C. Hueper).

Agent	Site of Cancer	Number of Cancer Cases in U.S.A.	Number of Cancer Cases in Europe	Total
Arsenic	Skin	7	25	32
Coal-tar pitch	Skin	110	3,150	3,260
Petroleum	Skin	70	29	99
Shale oils	Skin	7	1,900	1,907
Lignite tar and paraffin	Skin	—	14	14
Creosote oil	Skin	1	40	41
Anthracene oil	Skin	—	20	20
Soot-carbon black	Skin	1	190	191
Aromatic amines	Bladder	350-400	1,200	1,600
Roentgen and radium radiation	Skin	?	?	?
	Leukemia	16	13	29
	Lung	—	650	650
Arsenic	Lung	7	16	23
Asbestos	Lung	20	90	110
Chromates	Lung	75	65	140
Nickel	Lung	0	84	84
	Nasal Cavity	0	51	51
	Nasal Sinus			
Coal-tar pitch	Lung	0	53	53
Petroleum	Lung	7	33	40
Benzol	Leukemia	11	31	42
Isopropyl oil	Lung	1	0	1
	Larynx	4	0	4
	Nasal Sinus	6	0	6
Radioactive chemicals	Bones	9	0	9
	Nasal Sinus	3	0	3
Mustard Gas?	Lung		3 (Japan)	3
Total (approximate)		750	7,650	8,400

labor turnover in many of these hazardous industrial operations is rather high, it stands to reason that this group of unrecognized occupational cancers is relatively large and that many of the workers affected by them ultimately become, with their families, wards of community, State and Federal welfare agencies.

Reliable observations made in Canada and in various European and Asiatic countries indicate that occupational cancer hazards exist in other industrial operations and occupations in addition to those mentioned in American reports. In fact, varying degrees of contact with known or strongly suspected occupational carcinogens exist for many industries and large worker groups for which, at present, no competent occupational cancer surveys are available, such as the rubber industry, steel and nonferrous-metal industries, dye and organic chemical as well as pharmaceutical industries, petroleum and coal-tar industries, textile industries, plastic, resin and paint industries, and the various branches of the transportation industry (railroads, trucking, aviation). There has been no worthwhile critical analysis made of the possible influence of the widespread use of the host of food additives, pesticides, sprays, detergents with and without dyes, cosmetics and drugs on

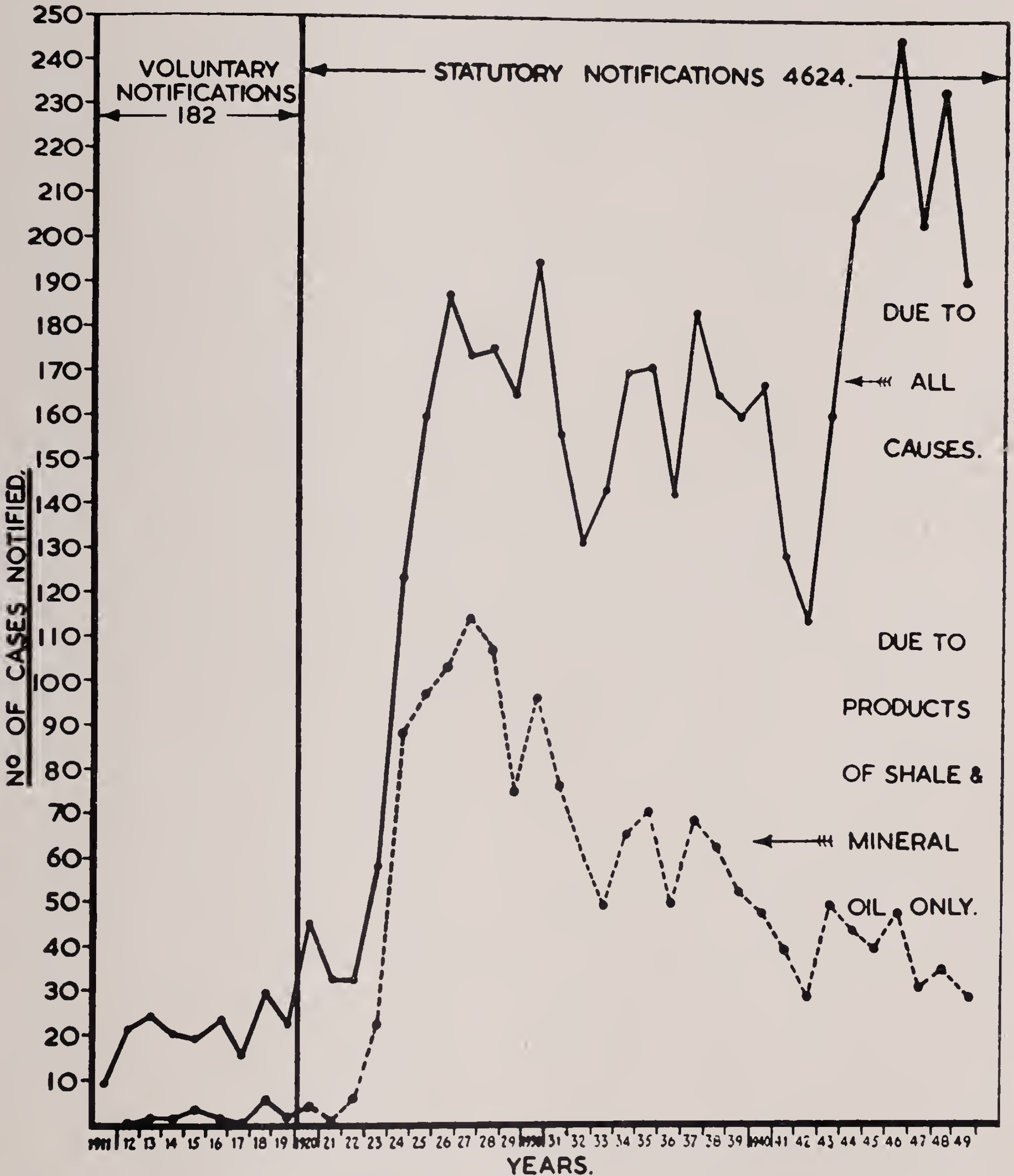


Fig. 1. Graph showing the number of cases of cutaneous carcinoma in male and female patients in England, Wales, and Scotland from 1911 to 1949, inclusive. Note the tremendous increase when reporting of cases was made statutory in 1920. The dotted portion of the graph denotes the number of cases contributed by shale oil and mineral oil only.

the environmental cancer panorama. It is only in recent years that pollution of the air, water and soil by industrial agents has seriously been considered as a possible cause of cancer.

It is mainly through this lack of proper awareness and reporting of existing and possible but unexplored environmental cancer hazards that the erroneous impression prevails in some circles that industry-related carcinogens are of minor importance, not only as an industrial health problem but also as a significant part of the general cancer problem. The introduction of statutory notification of all precancerous and cancerous lesions attributable to or suspected of occupational origin would greatly improve our highly defective epidemiologic records. The evident effectiveness of this procedure is strikingly demonstrated by a graph (Fig. 1) prepared by Henry[1] showing the number of cases of cutaneous carcinoma in male and female patients in England, Wales and Scotland notified before introduction of statutory notification and subsequent to it.

A second source of an incorrect evaluation of the importance of industrial cancers as an industrial health problem is related to the prevailing concept that these cancers contribute little to absenteeism. If the period of absence from work would be calculated not on the basis of the actual lifetime of the cancer victim but for his presumptive life expectancy, which is shortened by a precocious death from cancer, occupational cancers would acquire a much higher rating as causes of absenteeism than that with which they are charged at present.

It follows from these facts and considerations that industrial management and medicine are faced with several tasks for eliminating or containing industrial and industry-related, environmental cancer hazards and for devising means for preventing the future introduction of new ones. It seems to be wise and justified to discontinue the production and use of any agent which has been shown to cause cancer in man, if such an agent is not essential to human welfare and needs and, especially, if it does not serve any useful purpose. Any carcinogenic agent, even when essential and useful, should likewise be eliminated from the human environment, if an adequate noncarcinogenic substitute is available or can be developed and if the use of such a substitute is compatible with our present economic structure. Since a considerable part of the presently known industrial carcinogens forms an integral part of the products of our industrial economy and, therefore, cannot totally be eliminated, occupational and environmental exposure to them should be reduced by technologic methods to the lowest technically practicable level, because there is no reliable information available as to the minimal effective carcinogenic dose of any of the recognized industrial agents. Their degree of toxicity cannot be used as a guide in such matters, since there does not exist any parallelism between the toxic properties and the carcinogenic potency. It is well established, on the other hand, that the carcinogenic dose, as a rule, is well below the chronic toxic dose.

Industrial management and medicine would also be well advised to support the development of reliable and practicable chemical, physical or bio-assay screening procedures for the determination of potential carcinogenic qualities in existing and future chemical agents. The urgency of this appeal is attested by the fact that there exist a large number of chemicals capable of producing cancers in experimental animals and providing frequent and, in part, intensive contact, not only with large occupational groups but also with considerable portions of the general population. One American petroleum company, during recent years, has pioneered research on physicochemical methods for the discovery of carcinogenic oils. The demonstration of marked carcinogenic properties during chronic toxicity tests prevented the release of styryl 430 as a trypanocidal agent and of 2-acetylaminofluorene as an insecticide. On the basis of similar evidence, various chemicals employed in the processing, coloring and preservation of foodstuffs have been barred or removed from the list of permitted food additives in this country and abroad (thiourea, thioacetamide, butter yellow, dulcin, light green SF). The production and industrial use of 4-aminodiphenyl as a rubber and antioxidant were recently discontinued in England and the United States because this chemical produced bladder cancers in man and dogs and intestinal and breast cancers in rats. The manufacture of beta-naphthylamine has been stopped in England, Switzerland and Germany by the industries concerned without any legislative pressure.

While the evidence supplied by experiments on animals provides suggestive, but not conclusive, information on the potential carcinogenic action of a particular agent in man, these data, nevertheless, give distinct warnings as to the indiscriminate use of such agents in the human environment. The general principle has been adopted to consider any chemical, which is able to cause cancer in any species when given by any route and any dose, as carcinogenic to man until shown to be innocuous.

It is obvious that the complex nature of the occupational and industry-related cancer problem as well as of the execution of an effective control program necessitates close cooperation between industry and the medical profession. A recent statement by Dr. Curphey, chairman of the Council Committee on Public Health and Education of the Medical Society of the State of New York, may appropriately be cited in this connection:

> "The harmful effects of such agents could be reduced by encouraging free exchange of information and scientific knowledge between industries and the medical profession rather than by attempting to hide facts or by actively or passively resisting the efforts of outside scientific investigators because of the fear of facing legal responsibility for compensation of the diseased worker."[2]

Medical Aspects

The first and fundamental step for the institution of practicable and effective primary cancer prevention rests on the discovery and identification of the carcinogenic agents or the specific conditions of exposure associated with the development of cancers. Since Pott, in 1775, described the first occupational cancer—namely the scrotal cancer in chimney sweeps due to an exposure to coal soot, practicing physicians, especially internists, surgeons and industrial physicians, can claim exclusive credit for having advanced our knowledge in the field of industrial and industry-related cancers. During the last fifty years, their efforts have been particularly rewarding, because the great majority of industrial carcinogenic agents, carcinogenic industrial operations and cancers have been placed on record during this period. These developments may well serve as a stimulus to the medical profession to continue and intensify its efforts in this field, because epidemiologic data on the relative frequency of cancers of various sites available for different large and small worker groups indicate that evidently only a few of the actually existing industrial carcinogens have been recognized. The recently reported excessive frequency of cancer of the lung among English boiler scalers, grain dockers and iron-ore miners provides additional suggestive evidence in this direction. Observations of similar import relate to the excessive rates for lung cancer found among members of several circumscribed groups of workers having contact with various known respiratory carcinogens (Table III).

TABLE III. OCCUPATIONAL GROUPS WITH EXCESSIVE INCIDENCE OF LUNG CANCER

Occupational Group	Potential Respiratory Carcinogens
Metal workers, welders, metal grinders and polishers, wire makers, tool and die makers, foundry workers, metal moulders, lathe workers, etc.	Metal dust, lubricating oil mist
Cigar manufacturers and tobacconists	Tobacco dust, insecticides, soot
Engineers, mechanics, machinists, plumbers, etc.	Metal dust, soot, lubricating oil
Painters, decorators	Metal pigments, coal-tar dyes, carbon black, asphalt paints, solvents, vehicles (lacquers, resins, synthetic plastics).
Tar workers, road workers, asphalters, paviours, stokers, patent-fuel workers, furnace men, foundry laborers, rollers, etc.	Tar and pitch fumes and dust, soot

Industry-related factors most likely play a role in the recorded differences of mortality rates from cancer in different states of the United States, different parts of the same state, and between metropolitan areas and small towns. Additional evidence favoring an influence of industry-related factors on cancer frequency rates is derived from the recently observed rise in lung cancers and leukemia and the shift in age distribution of cancers of the skin into younger age groups of both male and female white patients.

Similar shifts into younger age groups are characteristic for many occupational cancers affecting different organs, including the skin. This development is in part due to the fact that the average latent period of occupational cancers is apparently shorter than that associated with cryptogenetic cancers because of the usually greater intensity of exposure prevailing under occupational conditions. Another factor influencing this shift in age distribution is apparently represented by the age at entrance into a carcinogenic occupation, since the age at manifestation of industrial cancers seems to be directly related to the age at entrance into the hazardous occupation.

Exposure times adequate for the production of occupational cancers vary markedly with the potency of a particular agent and the degree and route of contact with it. Additional factors of importance in this respect are the tendency of an agent to be retained over long periods within the body (depot effect), to be rapidly excreted or metabolically inactivated, or to produce permanent and significant alterations in the tissue constituents, even after a single brief exposure (ionizing radiation effect). The occurrence of leukemias among the survivors of the atomic-bomb explosions in Japan furnishes an example of the last-mentioned type of exposure time, while the long-delayed development of skin cancers in persons who have contact with certain petroleum products provides an illustration located on the other extreme of this scale.

To be effective, contact with occupational carcinogens does not need to be continuous; it is often intermittent and may cease many years before the appearance of the cancer. There are often no bridging symptoms connecting the changes which may develop during or soon after exposure to a carcinogen starts and those which may appear and precede or be associated with the subsequent delayed appearance of the cancer. Reliable observations indicate that the length of exposure time may be much shorter than the latent or preparatory period. It follows from these experiences that preventive measures, to be maximally effective, must be applied during the early part of the exposure period, if not before actual exposure starts. After an effective exposure once has taken place, local removal of any precancerous lesions affords, at best, a mild degree of protection and often does not prevent the ultimate development of cancer, even when continued contact with the carcinogenic agent was stopped with the first appearance of precancerous manifestations.

Some of the occupational cancers are associated with characteristic warning symptoms or precancerous lesions, such as melanoderma, leukoderma, hyperkeratosis, cutaneous atrophies, chronic dermatitis, warts and papillomas following exposure to coal-tar products, petroleum oils, shale oils, arsenicals, ultraviolet radiation and ionizing radiation, hemorrhages, angiectases, polyps and papillomas of the bladder mucosa after exposure to aromatic amines, leukopenic and leukemoid reaction following contact with benzol and ionizing radiation, chronic radiation periostitis and asbestosis, whereas other occupational cancers do not elicit symptoms which may serve as stigmas of carcinogenic exposure of specific types. Some occupational cancers develop from these benign hyperplastic and neoplastic precursor lesions, whereas others appear de novo within the exposed tissues. At times such developments appear to occur very rapidly from an organic matrix which seemed to be free from any abnormalities only a few months previously. Thus, relatively advanced cancers of the bladder have occasionally been seen in dye workers who seemed to have a normal bladder only six months previously on cystoscopic examination. Similar observations were made in regard to the appearance of lung cancers in chromate manufacturers having an apparently normal roentgenogram of the thorax six months previous to the discovery of a lung cancer of definite proportions.

Although such experiences do not represent the rule, they nevertheless show that medical examinations performed at six-month intervals do not provide a precautionary procedure guaranteeing an early discovery of occupational cancers. For this reason, it seems wise to perform periodic medical examinations at intervals shorter than six months, particularly in those exposed workers who are approaching the end of the usual latent period. It is obvious that only long-term workers are appreciably benefited by the limited protection afforded by periodic medical examinations. Workers who, after an effective exposure, leave a hazardous operation for other employment run an uncontrolled risk of cancer development unless they are properly warned as to the possibility of cancer formation during subsequent years.

Because of these and other difficulties in providing adequate protection against the development of occupational cancers by medical means, it is advisable to supplement medical measures with a selective employment policy. On the basis of existing industrial medical experience, Negroes have been found to be more resistant to the carcinogenic action of coal tar, petroleum oils and ultraviolet radiation than are white persons, especially those who are fair complexioned and freckled. Colored workers might best be selected for employment in operations in which contact with these carcinogenic agents is unavoidable. Considering the fact that the occurrence of bladder cancers in dye and rubber workers has been traced to the presence of carcinogenic chemicals excreted with the urine, persons who may have conditions which might interfere with an unimpeded excretion of urine, such as hypertrophy of the prostate, strictures of the urethra and ureters, renal stones, diverticula of the bladder and vaginal prolapse of the bladder, should be excluded from employment in operations having this cancer hazard. It does not seem to be wise to accept persons with chronic inflammatory conditions of the lung, such as bronchiectasis, for employment in work entailing contact with respiratory carcinogens. Whenever practicable, only older persons should be employed in carcinogenic operations, because even if an effective exposure should take place, there is a good chance that their normal life expectancy may not cover the average latent period.

Although the great majority of occupational cancers have occurred in men for reasons of employment of men in such operations, there is no valid evidence indicating that men are more susceptible to occupational cancers than are women. Female luminous-dial painters experienced osteogenic sarcomas and carcinomas of the nasal sinuses; cancer of the lung was only slightly less frequent among female asbestos workers than among male workers, while the entrance of female cotton spinners in English plants was followed by the appearance of cancers of the exposed skin and vulva among the female employees, who thus showed the anatomic equivalents to the scrotal cancers noted for many years among the male mule spinners.

Whenever occupational exposure to industrial carcinogens was intense and uncontrolled, these agents have demonstrated their high carcinogenic potency, which is reflected in the markedly elevated cancer attack rates found among the populations at risk. These observations suggest that cancer hazards may exist for susceptible individuals employed in operations in which the same carcinogenic exposures prevail in an attenuated form.

It can definitely be stated that chemicals which are carcinogenic in the industries of one country or in one particular industrial operation possess the same properties for the industries of another country and for other industries, provided that similar or identical conditions of exposure exist. The spread of occupational bladder cancers in dye workers through different countries approximately fifteen years after establishment of large-scale dye production provides a striking illustration of this dogma. It is also certain that agents which cause cancer in man when used for medicinal purposes, such as trivalent arsenicals, have the same effect when coming in contact with man as environmental carcinogens in the form of industrial water pollutants or as occupational carcinogens during the smelting of arsenic containing ores or during the production and use as insecticides. Conversely, agents which are carcinogenic in industrial operations, such as coal tars, shale oils or ultraviolet radiation, do not lose this property when employed for therapeutic purposes.

In the discovery and management of industrial-cancer hazards, proper appreciation must be given to the fact that the target organ or tissue for a particular carcinogen may vary with the route of primary contact and with the physicochemical status of the agent. Thus, the same industrial carcinogen may elicit cancers in different organs under differing conditions of exposure. Cutaneous contact with radioactive material results in carcinomas or sarcomas of the skin; ingestion may cause osteogenic sarcomas, intravenous injection may cause cancers of the liver or lung, inhalation of dust or gases may cause cancer of the nasal sinuses or lung, and total body exposure may cause leukemia.

Summary

The facts and considerations presented indicate that effective control of industrial and industry-related cancers depends on competent and harmonious teamwork among industrial management, industrial chemists, physicists, industrial engineers, sanitary engineers, physicians, workers and the general public. It will mainly be the task of the physician, for the time being, to be on the alert for occupational

(Continued on Page 22)

Problems in Clinical Diagnosis and Classification of Ventricular Hypertrophy in Adults

1. *Idiopathic Left Ventricular Hypertrophy*

BEN SOMMERS, M.D.
Saint Paul, Minnesota

CARDIAC enlargement has been recognized clinically and at postmortem for about 300 years.[1] The vast majority of cases of cardiac hypertrophy are associated with a recognized cardiovascular disease, such as hypertension, valvular disease or congenital heart disease. Nevertheless, there remain a small number with enlargement of obscure cause.

It is the purpose of this series of three papers to discuss three distinct types of cardiac hypertrophy occurring in adults and presenting difficult problems in diagnosis and classification. The three groups comprise instances of (1) predominant left ventricular hypertrophy, (2) isolated right ventricular hypertrophy and (3) the entity that has been designated as "familial cardiomegaly."

This first paper deals with two cases of left ventricular hypertrophy of unknown cause.

Report of Cases

Case 1.—A forty-year-old white man was seen in February, 1947, because of nocturnal dyspnea and orthopnea of six months' duration. When the patient was eight years old, a physician heard "extra beats," and "leakage of the heart" was suspected. Past illnesses included pneumonia at the age of twelve and right pleural effusion at twenty-five, requiring thoracenteses. In 1940, an inguinal hernia was repaired. He stated that his blood pressure had always been normal. In 1945, he was rejected by the Army, presumably because of cardiac enlargement. He drank large amounts of wine, on occasion consuming as much as one quart of muscatel during an evening. Nevertheless, he worked for the same company for nineteen years, starting as a manual laborer and later holding a responsible position as a machine operator. The family history failed to reveal evidence of cardiovascular disease.

Examination revealed a well-nourished, muscular man 73½ inches tall and weighing 206 pounds. His skin was sallow but showed no stigmata of vitamin deficiency. Funduscopic examinations, carried out several times during the three years he was studied, failed to show evidence of hypertensive changes or other abnormalities. Pertinent findings consisted of moderate abdominal obesity and cardiac enlargement. On percussion, the left ventricular border reached the left anterior axillary line in the sixth interspace. There were no murmurs. The aortic second sound was not accentuated. Heart tones were rather distant considering the patient's body build. The pulse was regular. Numerous determinations of blood pressure were normal on the initial and subsequent examinations. Systolic readings ranged from 140 to 128 mm. of mercury, with a diastolic range from 78 to 90. Usual levels were approximately 128/85. Blood pressure in the two arms was equal. Pulsations in the femoral and brachial arteries were normal. No evidence of congestive heart failure was found on the first examination.

The value for hemoglobin was 15 gm. per 100 cc. of blood (Sahli); erythrocytes numbered 5,100,000 per cubic millimeter of blood, and the leukocyte count was 8,950; a differential count was normal. The sedimentation rate was 10 mm. in one hour (Westergren); a Kline test gave negative results. The basal metabolic rate was minus 17 per cent. Serum cholesterol measured 295 mg. per 100 cc. Radiologic studies by means of fluoroscopy and 6 foot films revealed moderate left ventricular enlargement and slight right ventricular enlargement. Cardiac pulsations were normal. The electrocardiogram showed left axis shift, slight ST depression in standard lead I, and increased voltage of R in lead I and S in lead III.

Therapy consisted of a moderate weight reduction diet plus adequate supplements of vitamin B complex. Because of the slight elevation of serum cholesterol and the low basal rate, a therapeutic two-month trial of thyroid extract was given without benefit. Subsequent basal rates were all considered questionable because of the patient's claustrophobia.

To rule out antecedent hypertension, this patient's former physicians were contacted. Determinations of blood pressure at the age of twenty-five and again at thirty-three were available, as well as a few since that time; all were normal. Army records were unavailable. Coronary sclerosis was deemed unlikely because of the absence of angina pectoris, and myxedema and beriberi were ruled out by therapeutic trial.

From February, 1947, until his death in December, 1949, the patient ran a slowly progressive downhill course, although he was able to continue doing light work until January, 1949. Digitalization, a low-sodium diet and mercurial diuretics were needed to control left

---

From the Charles T. Miller Hospital, Saint Paul, and the University of Minnesota, Minneapolis, Minnesota.
Part I of thesis submitted for admission to the Minnesota Academy of Medicine, April, 1954.

heart failure. Rapid deterioration in his cardiac status occurred in January, 1949, with increase in cardiac size and beginning right heart failure. Dr. George E. Fahr saw the patient at this time and concurred in the diagnosis of left ventricular hypertrophy of unknown cause (Fig. 1). Prolonged periods of rest in bed were necessary in 1949 but did not halt the downward course. Auricular fibrillation and pulmonary infarction developed in November, 1949, when the patient was hospitalized. Death occurred in December, 1949, from congestive cardiac failure. The antemortem diagnosis was left ventricular hypertrophy of unknown cause.

Necropsy was performed by Dr. Kano Ikeda. The heart weighed 920 gm. The epicardial surface was smooth and glistening. There was gross dilatation of all the cardiac chambers. The myocardium of the left ventricle was 1.5 to 2 cm. in greatest thickness and was pale, cloudy and reddish brown, with no gross areas of fibrosis or infarction. A large mural thrombus 3 cm. in diameter was tightly adherent to the posterior wall of the left ventricle, interspersed among the papillary muscles. There were, likewise, multiple smaller mural thrombi scattered through the papillary musculature of the remainder of the left ventricle. The right ventricle was dilated and the wall measured up to 12 mm. in thickness. The valves showed no abnormalities. The pulmonary artery was markedly dilated. The root of the aorta showed a smooth intimal surface with only a very few streaks of subintimal atheromatous thickening. The coronary arteries were widely patent and freely pliable; they showed only a very slight amount of atheromatous thickening in their proximal portions.

Microscopic sections of the myocardium showed interstitial edema and hypertrophy of the muscle cells. The thrombus of the mural endocardium of the left ventricle exhibited organization. Microscopic study of the kidneys failed to show evidence of nephrosclerosis.

Other findings at necropsy were multiple pulmonary infarcts with pulmonary congestion and edema, chronic passive congestion of the liver and spleen, bilateral pleural effusion and ascites, multiple renal infarcts, and multiple petechiae and small ecchymotic areas involving the skeletal muscle, subcutaneous tissue and subserosal fat, as well as the areolar tissue of the mediastinum.

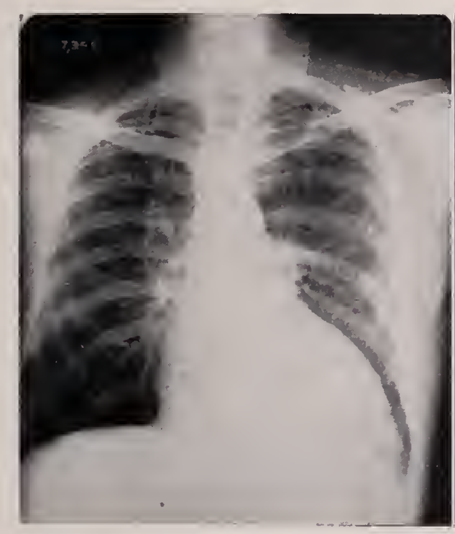


Fig. 1. (Case 1.) Thoracic roentgenogram taken in February, 1949, shortly after rapid deterioration of the cardiac status had occurred.

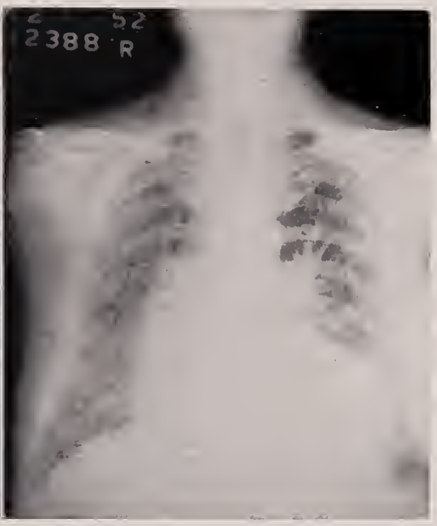


Fig. 2. (Case 2.) Thoracic roentgenogram shortly before death.

Case 2.—A fifty-five-year-old white man died in December, 1952, of congestive heart failure. Shortness of breath and constrictive thoracic pain on exertion had begun sixteen years previously following hemorrhoidectomy. At that time, an electrocardiogram showed complete left bundle-branch block. Digitalis was administered. Examination disclosed pronounced left ventricular hypertrophy, the x-ray silhouette being that of a boot-shaped heart (Fig. 2). One roentgenologist commented that it was unusual to have such minimal changes in the aortic arch as compared with the size of the heart. The blood pressure was normal on all examinations throughout the sixteen-year period preceding his death, usual readings being in the neighborhood of 120/80. In 1948, a pressure of 140/90 was obtained during a hospital admission for bronchitis. Heart murmurs were not heard, and the clinical diagnosis was coronary sclerosis with left ventricular enlargement, congestive heart failure and angina pectoris. Numerous physicians examined this patient during the course of his illness, and in 1951 he was examined at the Mayo Clinic, which reported normal blood pressure. Regular examinations had been performed for years, since the patient was a railway employe.

Necropsy was done by Drs. Kano Ikeda and C. Jarvis. The heart weighed 700 gm. The epicardial surface was smooth. The myocardium was flabby and light reddish brown. All chambers of the heart were markedly dilated. The right and left auricular appendages each contained moderately firm, reddish-brown thrombotic material. The remaining mural endocardium was smooth. The valves were normal. The coronary arteries were thin-walled, pliable and patent. A few scattered streaks of atheromatous thickening were present in the root of the aorta.

The aorta was smooth with the exception of a calcified atheromatous plaque located just above the bifurcation. There was no coarctation.

Microscopic sections of the heart showed small patches of fibrosis, myocardial edema and hypertrophy of the muscle fibers.

Sections of the kidney showed scattered foci of lymphoid-cell infiltration and a few hyalinized glomeruli. There was no evidence of nephrosclerosis.

The pathologic anatomic diagnoses were idiopathic hypertrophy of the heart with dilatation, mural thrombi in both auricular appendages, chronic passive congestion of the lungs and liver, old infarction of the kidneys, pulmonary edema and prostatic hypertrophy.

Comment

In 1901, Josserand and Gallavardin[2] were the first to describe idiopathic hypertrophy of the heart. Excellent reviews of the adult cases have been made by Levy and Von Glahn,[3,4] Levy and Rousselot,[5] and Norris and Pote.[6] Levy and Von Glahn reported ten cases of cardiac hypertrophy of unknown cause, eight in men and two in women. All were distinguished by a relatively short clinical course of from ten days to five years, without antecedent infection and with the primary symptoms of myocardial insufficiency. Angina was conspicuous by its absence (in contradistinction to our Case 2). At necropsy, all showed absence of advanced coronary sclerosis, but two cases showed extensive fibrosis. Necrosis of the heart muscle was present in four. A question thus arises whether the presence of fibrosis did not signify pre-existing myocarditis (if generalized) or coronary insufficiency (if mainly subendocardial). Myocarditis was also possibly implicated in two of the four cases reported by Norris and Pote.[6]

The possibility of antecedent hypertension has been explored by a number of investigators. Davis and Blumgart[7] stated:

> "To rule out the existence at any previous time of arterial hypertension is always difficult since fluctuations in blood pressure in this condition always render it theoretically possible that the blood pressure may have been elevated prior to the first recorded physical examination or between the various examinations listed."

Kaplan and associates[8] studied the arterioles of the kidney and adrenal in forty-three cases of congestive heart failure with predominant left ventricular hypertrophy of unknown origin and noted that 30.9 per cent had mild or severe renal arteriolosclerosis. Of 269 patients without hypertension, 12 per cent showed renal arteriolosclerosis that bore a relationship to their age. Of 154 patients with essential hypertension, 82.5 per cent dying in congestive cardiac failure showed renal arteriolosclerosis. These authors concluded that, although the role of antecedent hypertension cannot be excluded in the individual case of hypertrophy of the left ventricle of unknown cause, its absence in the majority of these cases seems likely. In a similar study, Ferris[9] found that renal and pancreatic arteriolosclerosis was present at necropsy in 40 per cent of fifty cases of left ventricular hypertrophy of undetermined cause.

Clawson,[10] on the other hand, has a different concept of the cause of this condition. Hypertension was absent in 5 per cent of his very large necropsy series of cases of "hypertensive" heart disease. If, however, a diastolic level of 90 mm. of mercury was chosen to separate hypertensive from nonhypertensive patients, very few remained in the nonhypertensive group.

Pertinent to the present discussion of possible etiologic factors in cardiac hypertrophy is the injury theory of hypertrophy, first propounded by Horvath[11] as early as 1897. According to this hypothesis, hypertrophy from whatever stimulus is due to stretching muscle fibers beyond the normal. Work and hypertrophy are both considered results of the stretching.[7]

Albrecht,[12] in 1903, described histologic evidence of muscle injury preceding hypertrophy and believed that hypertrophy was due to disturbance of normal cardiac nutritional requirements. Eyster's experiments[13,14] were most interesting and provocative. Aortic stenosis was produced by application of rubber bands in dogs until maximal dilatation resulted (usually on the third to sixth day). The bands were then removed in half the animals but allowed to remain in the other half. The hypertrophy that ultimately developed in both groups was comparable. Hypertrophy was considered a reaction to injury brought about by the sudden dilatation. Davis and Blumgart's work[7] on the relationship of coronary arteriosclerosis and congestive failure to cardiac hypertrophy favors the injury theory of Horvath. Little or no hypertrophy was present with lesser degrees of coronary sclerosis, but heart weights were considerably above normal in patients with coronary disease and congestive failure. Connolly and Littmann[15] confirmed this work and quoted Fulton's statement:[16] "This increased diastolic volume develops in toxic and inflammatory states and when the blood supply to the muscle is impaired." Further confirmation of the injury theory is found in the experimental production of hypertrophy in rabbits by Katz and associates[17] and by Hurwitz and Friedberg.[18]

Bell and Clawson,[19] Nathanson,[20] Levine,[21] Lisa and Ring[22] and others[23-25] deny the role of coronary sclerosis in the causation of cardiac hypertrophy. Gross and Lisa,[25] in a pathologic study of eighteen cases of left ventricular hypertrophy without a history of hypertension (material obtained from necropsy records alone) and with moderate to severe coronary sclerosis, found renal arteriolosclerosis in each case. They concluded that antecedent hypertension accounted for the cardiac hypertrophy.

The possible role of endocrine and neuroendocrine factors in the production of cardiac hypertrophy was discussed by Raab.[26] The occurrence of marked hypertrophy of the heart without hypertension in certain cases of acromegaly and the experimental production of cardiac hypertrophy in animals by the administration of growth hormone, thyroxin and desoxycorticosterone suggest neurohormonal influences in the causation of idiopathic cardiac hypertrophy.

Summary and Conclusions

Two cases of predominantly left ventricular hypertrophy have been described. Both patients were men forty-three and fifty-five years of age at death. Both died of congestive cardiac failure of three years and sixteen years' duration, respectively. The second patient had effort angina, and his electrocardiogram showed complete left bundle-branch block. A valid etiologic basis for the cardiac hypertrophy was not disclosed by clinical and necropsy studies.

The role of coronary sclerosis, antecedent hypertension and neuroendocrine factors has been discussed in the production of this type of cardiac enlargement. Although no definite conclusions have been reached, it seems wise, meanwhile, to avoid labeling as "hypertensive" those large hearts whose enlargement is of unknown cause. The term "idiopathic" is justified, serving as a stimulus to more profound study of these cases. Final solution of this problem awaits a more nearly complete understanding of the physiology and biochemistry of cardiac hypertrophy.

References

1. Willius, F. A. and Keys, T. E.: Cardiac Classics. Pages 173. St. Louis: C. V. Mosby Company, 1941.
2. Josserand, E. and Gallavardin, L: De l'asystole progressive des jeunes sujets par myocardite sub aigue primitive. Arch. gen. de Med., 78:513, 684, 1901.
3. Levy, Robert L. and Von Glahn, William C.: Further observations on cardiac hypertrophy of unknown etiology in adults. Tr. A. Am. Physicians, 52:259-263, 1937.
4. Levy, Robert L. and Von Glahn, William C.: Cardiac hypertrophy of unknown cause. Am. Heart J., 28:714, 1944.
5. Levy, R. L. and Rousselot, L. M.: Cardiac hypertrophy of unknown etiology in young adults. Am. Heart J., 9:178, 1933.
6. Norris, R. F. and Pote, H. H.: Hypertrophy of the heart of unknown etiology in young adults: report of four cases with autopsies. Am. Heart J., 32:599, 1946.
7. Davis, David, and Blumgart, Herrman: Cardiac hypertrophy: its relationship to coronary arteriosclerosis and congestive heart failure. Annals Int. Med., 11:1024, 1937.
8. Kaplan, B. I., Clark, E., de la Chapelle, C. E.: A study of myocardial hypertrophy of uncertain etiology, associated with congestive heart failure; with consideration of the role of antecedent hypertension. Am. Heart J., 15:582, 1938.
9. Ferris, H. A.: Arterioles of kidney and pancreas in cases of cardiac hypertrophy of undetermined causation. Circulation, 2:414, 1950.
10. Clawson, B. J.: Personal communication.
11. Horvath, A.: über die Hypertrophie des Herzens aus den Vorlesungen über Allgemeine Pathologie. Forward by A. Weichselbaum. Wien and Leipzig: W. Braumueller, 1897.
12. Albrecht, E.: Der Herzmuskel und seine Bedeutung für Physiologie, Pathologie, und Klinik des Herzens. Berlin: J. Springer, 1903.
13. Eyster, J. A. E.: Cardiac dilatation and hypertrophy. Tr. A. Am. Physicians, 42:15, 1927.
14. Eyster, J. A. E.: Experimental and clinical studies in Cardiac hypertrophy. J.A.M.A., 91:1881-4, 1928.
15. Connolly, E. P. and Littmann, David: Coronary arteriosclerosis and myocardial hypertrophy. New England J. Med., 245:753, 1951.
16. Fulton, J. F.: Textbook of Physiology. 16th ed. P 672. Philadelphia: W. B. Saunders Co., 1949.
17. Katz, L. N., Saunders, A., Megibow, R. S. and Carlen, S.: Heart size and experimental atheromatosis in rabbit. Am. J. M. Sci., 200:731, 1940.
18. Hurwitz, M., and Friedberg, L.: Relationship of heart size to cholesterol content in experimental atheromatosis of rabbit. Arch. Path., 34:875, 1942.
19. Bell, E. T., and Clawson, B. J.: Arch. Path., 5:939, 1928.
20. Nathanson, M. H.: Am. J.M.Sc., 170:250, 1925.
21. Levine, S. A.: Coronary Thrombosis. Batlimore: Williams and Wilkins, 1929.
22. Lisa, J. R., and Ring, A.: Arch. Int. Med., 50:131, 1932.
23. Nemet, G., and Gross, H.: Am. Heart J., 10:643, 1935.
24. Miller, H. R., and Weiss, M. M.: Arch. Int. Med., 42:74, 1928.
25. Gross, Harry, and Lisa, J. R.: New York State J. Med., 43:1030, 1943.
26. Raab, Wilhelm: Hormonal and Neurogenic Cardiovascular Disorders. Baltimore: Williams and Wilkins Co., 1953.

A Study of Ruptured Uteri

J. A. MALERICH, JR., M.D.
West Saint Paul, Minnesota

RUPTURED UTERUS is undoubtedly the most serious obstetrical complication encountered in medical practice. The present study of that complication was made at a private Minnesota hospital. Interest in the subject was fanned into activity by an unusual, thought-provoking circumstance. Four ruptures and one uterine rent took place between June and November, 1954.

TABLE I. REVIEW OF STATISTICAL STUDIES ON RUPTURED UTERI

Hospital	Period	Deliveries	Ruptured Uteri		Cesarean Section Rupture	Spontaneous Rupture	Traumatic Rupture
			No.	Incidence			
Private Minnesota	1944-1954	29,084	9	1:3232	67.0%	22.0%	11.0%
New York	1932-1946	111,753	57	1:1961	45.6%	36.8%	17.6%
Philadelphia County	1931-1941	318,103	105	1:3029	32.2%	25.1%	42.6%
New Orleans	1913-1950	127,522	96	1:1328	24.0%	30.2%	45.8%
Johns Hopkins	1920-1945	53,574	53	1:1010	18.8%	32.1%	49.1%

The above statement may give the impression of poor obstetrics, but the total statistics present a different story. These statistics cover the ten-year period from November 1944 to November 1954.

Table I compares four major studies of ruptured uteri with the present private hospital study. The classification of ruptured uteri is divided, for statistical purposes, into three groups. The largest is the post-cesarean section rupture group. Second, the traumatic rupture group, includes those ruptures caused by manipulative procedures and the use of pitocin. The third group is spontaneous rupture due to other (than the above) causes, such as great parity, multiple pregnancies, cervical tears.

The incidence of ruptured uteri to total deliveries is generally considered to be about 1:2000. This table presents the incidence of three groups: (1) charity hospitals—New York, New Orleans and Johns Hopkins; (2) the Minnesota private hospital; and (3) the combined private and charity hospital group of Philadelphia County. The implication is that private hospitals have a lower incidence of uterine rupture due to the smaller number of complicated cases. In our study, the incidence of uterine rupture was unusually low until the four ruptures occurred in the last five months of the study. With five ruptures, instead of nine, the incidence was 1:5400. Two thousand deliveries have occurred since the study, without rupture.

The frequency of post-cesarean section rupture has increased, and the frequency of traumatic rupture has decreased. It is noted in Table I that the four major studies and ours confirm this point. This has been a logical transition, over the years, because of the decreasing risk of abdominal delivery and the relative infrequency of the more difficult vaginal deliveries; such as, mid-forceps, high forceps, and version. The spontaneous rupture group, relatively unaffected by the uses of antibiotics and the changes in techniques, has maintained a constant frequency.

Table II presents first, the six post-cesarean section rupture cases. These six ruptures occurred among the 1,021 cesarean sections performed since 1944. Therefore, one in every 170 cesarean sections (0.58 per cent) ruptured. Since there were 29,084 deliveries and 1,021 sections, cesarean sections accounted for 3.5 per cent of the deliveries.

Two of the six cases ended in complete rupture. Both patients had previously had classical cesarean sections.

Four of these six cases ended in incomplete rupture. Two of the patients had had both lower and upper segment sections. One had had two classicals and one had had a single lower segment section. However, all three low segment sections were vertical, and two of these had had sections through the placental site.

TABLE II. CASE STATISTICS

Mrs.	Age	Gravida	Para	Types	Previous Sections	Gestation	Rupture
L.M.	31	6	3	Post Section	Classical	30 wks.	Complete
D.W.	41	2	1	Post Section	Classical	33 wks.	Complete
J.K.	27	2	1	Post Section	Vertical Low Segment	42 wks.	Incomplete
S.G.	23	3	2	Post Section	Classical	36 wks.	Incomplete
E.R.	33	3	3	Post Section	Classical Classical Vertical Low Segment	30 wks.	Incomplete
L.J.	33	3	2	Post Segment	Classical Vertical Low Segment	38 wks.	Incomplete
F.M.	36	6	5	Traumatic	0	42 wks.	Complete
D.D.	39	6	4	Spontaneous	0	40 wks.	Incomplete
M.H.	37	3	1	Spontaneous	0	41 wks.	Incomplete

No baby lived following complete rupture, but 75 per cent of the babies in the four incomplete rupture cases survived.

Both spontaneous rupture cases had incomplete ruptures into the left broad ligament with severe retroperitoneal hemorrhage.

Only one of the nine ruptured uteri, the case of Mrs. S. G., was amenable to repair. The rupture was small and at the lower part of the upper segment. This patient is now six months pregnant and hospitalized because of ruptured membranes.

Lastly, no case was in labor prior to rupture.

* * *

Rare and complicated cases appear common during the years of specialized training when on an active service. Private practice places the complicated case in its correct frequency. Yet, it is our duty, as private practitioners, to immediately diagnose and intelligently treat these rare complications. Therefore, it seems a review of our cases by groups would be of greatest interest here.

The largest group, spontaneous post-cesarean rupture, comprises six of our nine cases. It is acknowledged that this group is more readily diagnosed than the other types of rupture. It is also acknowledged that not all cases present classical signs and symptoms. Some are simply incidental findings at repeat cesarean sections.

Four of our cases had had histories of circumstances predisposing to uterine rupture and confirmatory signs and symptoms. Three of these had had febrile post-section courses and two had had sections through the placental site at previous abdominal deliveries.

Two of our cases were more complex. The first patient had congenital heart disease with superimposed subacute bacterial endocarditis. She had sudden severe low abdominal pain, nausea and vomiting, and vaginal bleeding at eight months' gestation. X-ray examination showed low placental insertion. The immediate diagnosis was rupture, but fear of the cardiac disability caused delay. Later a cardiologist cast doubt on the diagnosis by insisting that the marked hemoglobin drop was due to subacute bacterial endocarditis. After ten days' delay, the patient went to surgery. An incomplete chronic type of rupture was found, and the baby amazingly survived . . . as did the mother.

The most complicated case was that of Mrs. D.W., a forty-one-year-old para 1-0-0-1. She had a past history of peptic ulcer ten years previously, total thyroidectomy for hyperthyroidism, and classical section three years ago. Her pregnancy was normal up to her last office visit at thirty-two weeks' gestation. She was admitted to the hospital at 11:00 A.M., October 22, at thirty-four weeks' gestation, following sudden onset of coffee-ground emesis and colicky upper abdominal pain. She was pale, toxic looking, had peristaltic movements across a distended upper abdomen and a pulse of 110. Her uterus was eight months' size and cramping moderately. Fetal heart tones were heard in the right upper quadrant. An internist and a surgeon were called in, and their preliminary diagnosis was bleeding peptic ulcer. However, following confirmation by x-ray, small bowel obstruction was considered to be the diagnosis. Therefore, four hours after admission, the patient was taken to surgery. The abdomen was opened, and blood welled out. Instead of an obstructed bowel, the fetus and placenta were directly beneath the incision. The uterus was ruptured from 3 cm. below the bladder reflection through the fundus. The baby was stillborn. Hysterectomy was done.

Two ideas may be beneficially gleaned from the above cases. First, there is need of available and accurate past histories on all post-section patients. The anticipatory histories presented above were not completely obtained until after the emergency, and in some cases, were not obtained until the charts were reviewed for this study. Second, consultants are only a part of the "armamentarium" of the obstetrician. The former can advise only relative to his field. The obstetrician is the man best qualified to be responsible for the diagnosis and final disposition.

The traumatic rupture group has been distinctly diminished (4). As presented earlier, this is due partially to the increased use of the cesarean section and partially to the decreasing frequency of the more difficult vaginal deliveries. However, of those cases remaining, the diagnosis is just as puzzling and the treatment just as hazardous as before. Maternal and fetal mortality remains highest in this group.

One and one-half of our cases belong to traumatic rupture. The half case is that of a uterine rent. The rent was found at surgery, the second day postpartum, following the delivery of a stillborn. This grandmultipara had painless bleeding but no placenta previa, was stimulated with intravenous pitocin, and dilated with no abnormal contractions. After delivery, only moderate pressure was used to express the placenta. The postpartum course was stormy and identical to a fundal rupture. At surgery, 1300 cc. of blood and a 5-inch rent through the serosa into the muscularis were found. The cause??? . . . undetermined.

The true case of traumatic rupture is that of injudicious use of pitocin. This is an unpredictable drug. Many obstetricians have discontinued or greatly limited its prepartum and intrapartum use.

Mrs. F.M., a thirty-six-year-old gravida VI, had a history of five normal pregnancies, labors and deliveries. Now, again, at term and in early labor, she was admitted to the delivery section. Her progress was normal in spite of an exceptionally flabby uterus and extreme restlessness. She was prepared for delivery, and by 11:00 A.M. the head was 1 plus and dilation almost complete. However, the patient went into secondary inertia, and one minim of pitocin was given. In about five minutes, there was a sudden gush of blood, the patient became increasingly apprehensive, restless, and had air hunger. The fetal head went "way up." Version was elected, the patient anesthetized, and an unusually easy procedure accomplished the version. The patient came out of the anesthesia and appeared normal. However, about nine hours later, following increasing apprehension, abdominal pain and distention, she went into shock. She was taken to surgery, and a tremendous rupture from the anterior cervix to the fundus was found. Omentum filled the rent and only 200 cc. of blood were in the abdomen. Hysterectomy was done.

The last group is the spontaneous, nonsection, rupture group. Diagnosis seems most difficult in this group. First, all the possible extenuating signs and symptoms that occur in the other groups (classical and distorted signs, complete and incomplete ruptures, symptoms indicative of other pathologic conditions) can and do happen here. Add the difficulty of surprise, the lack of anticipation, and we have the crowning complication to diagnosis. Treatment also is thoroughly different and considerably more difficult in this group than in cesarean scar rupture.

Our problem case was Mrs. D.D., a thirty-nine-year-old gravida VI, para III. She was admitted at term following spontaneous rupture of membranes. Spontaneous contractions began at 9:00 P.M., and delivery occurred about three hours later at 11:54. An easy manual rotation, at low station and at complete dilation, was done from ODP to ODA. There was a slight gush of blood following the delivery of the head. The baby was slow to respond and attention was given him. About four minutes later, attention was returned to the patient. The placenta was delivered spontaneously and completely. Bleeding subsided, then became more profuse. Ergotrate was given intramuscularly, the uterus was massaged and lifted out of the pelvis. Intravenous ergotrate was given. Bleeding subsided again. Intravenous fluids had been ordered and were started at 12:20. Also, blood typing and cross matching had been ordered. The patient went into shock. Blood was not available until about forty-five minutes after it was ordered. It was then pumped in under pressure. In the interim, the cervix was observed to be intact, and the vagina was packed. In the excitement of the emergency, however, the uterine cavity was not explored manually. The packing seemed to control the bleeding for a time, and the patient's condition improved; but at no time did the systolic pressure reach 80 mm. Hg. Shortly, blood seeped through the packing, and hysterectomy was ordered. The clinical diagnosis was uterine rupture. Approximately two hours after delivery, the hysterectomy was completed but the patient was *in extremis* and expired. A large retroperitoneal incomplete rupture into the left broad ligament was found. Blood had dissected even as far as the kidneys.

Four major points are especially worthy of comment.

1. Bleeding in excess of 300 cc. is considered hemorrhage. Blood replacement must be ready for this loss — especially in the case of rupture. A minimum of 1000 cc. of type O Rh negative blood must be on hand in the delivery suite at all times. This is to be used until cross matching and typing can occur.

2. Whenever the bleeding is hemorrhagic, a patient shows shock, or a delivery has been done in which injury to the lower uterine seg-

ment could have occurred, the whole of the uterus, fundus and low segment, must be explored for lacerations, retained placenta, and membranes. The cervix must also be explored and inspected. These procedures are essential to establish the diagnosis.

3. Packing the uterus is such a controversial subject that it demands a separate paper. However, Gordon et al. consider it an obsolete treatment.[1] They consider that, worst of all, it gives a false sense of security, causes waste of time while the packing is saturating with blood, and more often than not fills the uterus with blood rather than making it contract. They do consider it useful in the single instance in which the patient cannot be immediately placed in the operating room. The opposite viewpoint—that there is a definite place for packing in the active treatment of ruptured uterus, is held by a number of investigators. Dr. Donald Frazer states, "Where rupture is confined to the lower uterine segment, packing, at times, can be used as definitive treatment."[4] In the case in which exploration does not present a tear, Brierton[5] suggests packing the uterus carefully and waiting to see if bleeding will recur.

4. The decision for hysterectomy is obviously a difficult one. However, when uterine exploration, as presented above, has confirmed the diagnosis, blood and more blood is given as needed, hysterectomy is the only answer. In the very severe cases, clamping the uterine vessels from below (vaginally) is advocated by some men. However, probably the most rapid and surest method of stopping this bleeding is to incise the abdomen (under local), retract the anterior abdominal wall and clamp the aorta above the biforcation. Dr. Kinsella[6] states that this can be done with rubber-tipped vessel forceps without damage to the aorta. He also states that this clamping can be maintained for approximately one hour. Following the clamping, there is ample time to replace the blood loss and bring the patient out of shock before proceeding with the necessary surgery.

In conclusion, I would advocate the use of teamwork. A team is a necessity. One man is needed to administer blood and intravenous fluids. Another is needed as an assistant in surgery. Besides these two, an anesthesiologist, a technician, two nurses and two aids will make up an excellent team. Everything must progress rapidly. A team can save time, show more care, and thus cut down maternal mortality.

Summary

1. Nine cases of rupture of the uterus have been reported. This represents the total number of ruptures occurring in a private hospital during the ten-year period from 1944 to 1954. In this time, 29,084 deliveries were accomplished.

2. Of these nine cases, six represented post-section ruptures, one traumatic rupture, and two spontaneous ruptures.

3. The fetal mortality was 50 per cent in the post-section rupture group. All the surviving babies belonged to the incomplete rupture segment of this group.

4. The post-section rupture group comprised 0.58 per cent of the 1,021 cesarean sections done in this hospital in the ten-year period.

5. There was one maternal mortality in the nine cases. This followed in the spontaneous rupture group.

6. These case studies should stress several important principles in diagnosis and treatment: (a) necessity of complete past histories on all previous cesarean section cases, (b) careful observation of these cases, prenatally and intrapartum, to detect the earliest signs of trouble, (c) exacting caution in the obstetric use of pitocin, (d) availability of 1000 cc. of Rh negative blood in the delivery suite, (d) following difficult vaginal labor or delivery, or any possibility of uterine rupture, intrauterine exploration (mandatory), (f) clamping the aorta, through an abdominal incision, suggested as a rapid method of controlling bleeding in severe cases of rupture, (g) necessity for teamwork in all cases of rupture.

Bibliography

1. Gordon, C. A.: Rupture of the uterus. Am. J. Surgery, 80:259, 1950.
2. Dugger, J. H.: Ruptured uterus in the last trimester of pregnancy. Surg. Clinics North America, 25: 1414, 1945.
3. Beacham, W. D.: Rupture of the uterus. Am. J. Obst. & Gynec., 61:825, 1951.
4. Frazer, D. C.: Discussion on rupture of the uterus during pregnancy or labor. Proc. Royal Soc. Med., 47:119, 1954.
5. Brierton, J. J.: Rupture of the pregnant uterus. Am. J. Obst. & Gynec., 59: 1950.
6. Kinsella, T. J.: Personal communication.

Study of 200 Consecutive Patients Hospitalized for Asthma

LOUIS E. PRICKMAN, M.D.
ROBERT L. SOMMERVILLE, M.D.
and RODNEY D. STEINMETZ, M.D.
Rochester, Minnesota

THE records of 200 consecutive patients hospitalized because of asthma were surveyed to determine the types of asthma in which hospitalization was required, the role played by infection and allergy in these patients, and the extent to which cortisone and corticotropin (ACTH) had been used in treatment of their asthma. Another purpose was to direct attention to the importance of complete study of the asthmatic patient in addition to consideration of allergy and asthma alone.

Most patients who come to the Mayo Clinic for investigation of asthma do not require care in the hospital. Among the many reasons for hospitalization of patients having asthma are: (1) severity of symptoms, such as status asthmaticus, severe nocturnal asthma and orthopnea; (2) necessity for intravenous or inhalation therapy; (3) need for investigation that requires special equipment, anesthesia or bronchoscopy; (4) treatment of complications of asthma, such as sinusitis, and (5) preoperative and postoperative care of asthmatic patients who are undergoing various surgical procedures.

Results

These 200 consecutive patients had a total of 263 admissions to the hospital from January, 1952, to December, 1953, inclusive. The type of asthma in these patients was classified on the basis of history, physical examination and laboratory findings into three categories according to cause: namely, (1) allergic, or atopic; (2) intrinsic (asthmatic bronchitis) and (3) mixed. The history was of the greatest importance in differentiating the allergic and intrinsic types. Asthma due to bronchial obstruction by tumors and foreign bodies was not included in this study. Likewise, asthma secondary to congestive cardiac failure and certain chronic pulmonary diseases was excluded, although these conditions occurred in a few instances as complications.

The patients ranged in age from eleven months to eighty-six years; ninety-three patients (46.5 per cent) were in the age group from forty-one to sixty years and twenty-four (12 per cent) were twenty years of age or less. The sex distribution in each etiologic group, as well as in each age group, was essentially similar (Table I).

The asthma in the fifty patients classified in the mixed group (allergic factors plus intrinsic factors) was primarily allergic in six and primarily intrinsic in thirty-four; allergic and intrinsic factors appeared to be of equal importance in the remaining ten. Psychogenic or nervous factors were prominent in the perpetuation of asthma in thirteen patients of the mixed group.

As will be seen in Table II, the importance of studying the patient in entirety and not just the patient's problem of asthma, important as it may be, cannot be overemphasized. In only twenty-three patients was asthma the sole medical problem; in the remaining 177 patients, one or more diseases were coexistent.

A total of sixty-seven of these patients had received cortisone or corticotropin for their asthma before coming to the clinic; twenty-one of them required additional steroid treatment during their hospitalization here. Nineteen additional patients, not treated with steroid agents elsewhere, required cortisone or corticotropin for control of their asthma while under our care.

Comment

Patients who have intrinsic asthma are much more likely to require hospitalization than are

---

From the Section of Medicine, Mayo Clinic and Mayo Foundation and the Section of Ophthalmology, Mayo Foundation. The Mayo Foundation, Rochester, Minnesota, is a part of the Graduate School of the University of Minnesota.

Read at the meeting of the Minnesota Society of Internal Medicine, Minneapolis, Minnesota, May 21, 1955.

The authors are indebted to Drs. G. A. Koelsche, H. M. Carryer, G. A. Peters, L. L. Henderson and G. B. Logan, on whose medical and pediatric services a number of these patients were investigated and treated.

TABLE I. AGE AND SEX DISTRIBUTION

Age (years)	Asthma, Type					
	Allergic		Intrinsic		Mixed	
	Male	Female	Male	Female	Male	Female
0-10	2	0	7	7	0	1
11-20	1	0	5	1	0	0
21-30	0	1	3	2	6	6
31-40	2	2	4	16	1	6
41-50	2	3	19	10	5	7
51-60	1	2	16	17	6	5
61-70	4	2	10	8	3	3
71-80	0	0	2	0	1	0
81-90	0	0	1	0	0	0
	12	10	67	61	22	28
Total	22 (11 per cent)		128 (64 per cent)		50 (25 per cent)	

TABLE II. COEXISTENT CONDITIONS OF CLINICAL SIGNIFICANCE

Condition	Patients
Nasal	
Polyps	47
Hay fever	37
Vasomotor rhinitis	34
Sinusitis	18
Respiratory	
Bronchostenosis	23
Pulmonary emphysema	20
Pneumonia	6
Löffler's syndrome	2
Bronchiectasis	2
Tuberculosis	1
Cardiovascular	
Essential hypertension	10
Congestive heart failure	6
Arteriosclerotic heart disease	6
Cor pulmonale	3
Periarteritis nodosa	3
Chronic rheumatic heart disease	1
Gastrointestinal	
Peptic ulcer	9
Cholelithiasis	8
Hiatus hernia	2
Genitourinary	
Cystocele	5
Inguinal hernia	5
Rectocele	3
Nervous	
Psychoneurosis	3
Anxiety state	2
Postarsenical neuropathy	1
Cutaneous	
Atopic dermatitis	5
Eczema	4
Neurodermatitis	2
Psoriasis	2
Hematologic	
Pernicious anemia	3
Polycythemia	2
Allergic	
Drug sensitivity	72
Aspirin	28
Penicillin	17
Iodides	8
Sulfonamides	6
Others	13

those whose asthma is due to allergy. Patients who have asthma as the result of contact with pollens occasionally are admitted to the hospital during the hay-fever season because of complications of asthma or because they must undergo some medical or surgical procedure. Such a patient is placed in an air-conditioned hospital room, if this is available. In the absence of air conditioning, a portable filter properly fitted to the window is entirely adequate to exclude pollen from the patient's room. Expensive air conditioning of a portion of a hospital for the care of asthmatic patients is not necessary or especially desirable. The patient who has asthma can be well cared for in the average clean hospital room provided certain simple precautions are taken.

The complications of asthma encountered in this series were all important and required special investigation and treatment. Among the most important were those of nasal and respiratory origin, as enumerated in Table II. A combination of asthma, nasal polyps and sensitivity to acetylsalicylic acid was noted in nineteen patients. As indicated in the same table, there were seventy-two instances of drug allergy requiring either treatment or precautions to avoid the drug to which the patient was sensitive. Since allergic reactions to drugs may be sudden, severe and even fatal, there should be on hand at all times a quickly available emergency kit containing sterilized syringes and epinephrine in a 1:1,000 solution, as well as aminophylline, 5 per cent solution of glucose, diphenhydramine hydrochloride (Benadryl) in doses of 50 mg. and hydrocortisone or corticotropin, all in solutions for intravenous use. Unless such emergencies are anticipated fully, much valuable time is lost in searching the hospital for the needed drugs. Oxygen and a BLB mask also should be quickly available.

The purpose of hospitalization of patients who have asthma is primarily to provide symptomatic relief and bring the asthma under control, so that the second and third objectives may be accomplished, namely to ascertain and to remove or treat the causes and the complications of asthma. Admittedly, these aims are not always accomplished but they are the patient's hope and should be the physician's goal. Great and valuable advances have been made in the development of remedies for relief of the symptoms of asthma, yet most patients with chronic asthma have had wide experience in their use and still have uncontrolled asthma. A great many asthmatic patients are taking steroids unwisely because of the symptomatic relief provided, little realizing that these hormonal agents in certain instances may do more harm than good.

The treatment of the 200 patients in this series for the most part was conservative. Symptomatic measures included rest, hydration, control of overcoughing, use of expectorants (usually iodides or ammonium chloride), administration of theophylline and use of epinephrine or related sympathomimetic preparations. Chemotherapy and administration of oxygen occasionally were necessary. Use of steroids was restricted to those patients whose asthma was inadequately controlled by conservative measures and in whom careful investigation revealed no contraindication to their use;

the hormonal agents were given in the shortest possible courses to combat the stress of severe or prolonged asthma. Many patients who had received steroids before admission experienced improvement on conservative management and often did not require additional exogenous hormonal therapy. All patients who had received either cortisone or corticotropin within six months and who had to undergo bronchoscopy, operations on sinuses or other surgical procedures were routinely prepared with steroids, the administration of which was continued for only a few days after operation.

Three deaths occurred in this series. One patient, who had intrinsic asthma, emphysema and recurrent bronchostenosis, died in status asthmaticus. The second had intrinsic asthma and died as the result of congestive cardiac failure secondary to cor pulmonale. The third patient, in whom the asthma was of mixed type, died after gastroenterostomy for a duodenal ulcer.

Summary

A study was made of 200 consecutive patients at the Mayo Clinic who were hospitalized for the treatment of asthma. The type of asthma was classified as intrinsic in 64 per cent of these patients, as allergic in 11 per cent and as mixed (both allergic and intrinsic) in 25 per cent. However, intrinsic factors were predominant in the latter group.

The complications most often encountered included nasal polyps, hay fever, vasomotor rhinitis, sinusitis, drug allergy, obstructive pneumonitis (bronchostenosis) and pulmonary emphysema. The triad of asthma, nasal polyps and sensitivity to acetylsalicylic acid occurred in nineteen patients.

The frequency of occurrence of a wide variety of accompanying conditions of clinical importance points up the necessity for a broad and thorough investigation of the patient beyond the study of the problem of the asthma alone. The occurrence of asthma uncomplicated by any other clinically important disease was noted in only twenty-three of these patients.

In most instances, conservative symptomatic treatment controlled the patient's asthma, but steroid therapy was resorted to in forty of the 200 patients. Steroid treatment was terminated as early as possible. Preoperative preparation with steroids was used in all instances when the patient had been given steroids within the previous six months.

The objectives in the hospital treatment of asthma are to provide symptomatic relief of symptoms and to search for the causes and complications of the patient's asthma, with removal of them when possible.

ENVIRONMENTAL CANCER

(Continued from Page 11)

cancers and, after their discovery, to provide for their early diagnosis and treatment and to further prophylaxis. The physician will be aided in these efforts by sanitary engineers and industrial chemists. The important task of primary prevention, on the other hand, does not belong to the medical domain but is reserved to the chemist, physicist and engineer. It is up to these members of the team to devise safe production and handling procedures, and, when necessary, to develop noncarcinogenic substitutes.

The degree of protection against industrial cancer hazards which can be attained with the full use of the available knowledge and facilities, however, depends also on the economic support which industrial management, labor, government and the general public are willing and capable to give to these efforts. It is safe to state that the conquest of environmental and industrial cancer hazards will be a gradual one and, in all probability, for many of these hazards only a partial one. It will resemble, in this respect, the pattern set in past decades by the successful containment of many infectious diseases. Success in this new fight will not come to us unless we know the facts and face them soberly and boldly.

References

1. Henry, S. A.: Ann. Royal Coll. Surgeons, England, 7:425-454, 1950.
2. Curphey, Th. J.: Occupational medicine in New York State. Health News, 31:17-18, 1954.

The Prospect for Tuberculosis Control

S. MARX WHITE, M.D.
Minneapolis, Minnesota

THIS is not a statistical analysis. I shall confine myself to principles and practices.

The committee which met in 1904 and laid the foundation for the National Association for the Study and Prevention of Tuberculosis need not be named in its entirety, but the names of five of them will have a familiar ring: Drs. William Osler, Edward L. Trudeau, William H. Welch, Abraham Jacobi and Henry M. Bracken. It was in the following year, 1905, the year of the first annual meeting of the Association, that I had the privilege of attending with my chief, Dr. Frank F. Wesbrook, in Washington, D. C. I was elected the first Secretary of the Laboratory Section and served for one year. It would be invidious to pick out any one number of the original committee for special acclaim, but I can never forget the impression made by Trudeau. In his address, he said the meeting "means that through knowledge have come responsibility and hope, and through both, action." He at that time could only say for the Association: "It cannot but prove a *powerful instrument in the struggle against tuberculosis in this country.*"

In that day, diagnosis was by percussion and auscultation of the chest and the finding of swarms of acid-fast bacilli in the sputum. These methods were crude. It was rare to recognize the early stages of the disease before cavitation was well advanced. Most cases were overlooked until symptoms made their appearance, and we now know that this is very late.

As a diagnostic tool, using minute doses subcutaneously to produce a rise of temperature, Koch's tuberculin was still in use and had considerable value in early and suspected cases. As a student in 1896, Dr. Christian Fenger had found during an appendix operation on me, some mesenteric lymph nodes which he suspected were tuberculous. Dr. Frank Billings gave me an injection of tuberculin, the size or dosage of which I do not know. That it was larger than in later use, I do know. The shocking reaction, almost fatal, gave a temperature rise to within two-tenths of 107 degrees Fahrenheit. Tuberculosis has given me no manifestations since.

The diagnostic use of tuberculin by the conjunctival reactions of Calmette and Wolff-Eisner were announced in 1907. The cutaneous reaction of Clemens Von Pirquet was announced the same year but has been replaced by the more accurate technique of the Mantoux skin test. We remember, however, that Von Pirquet introduced the word "allergy."

Few people remember that Von Pirquet was appointed Professor of Pediatrics in the Medical School of the University of Minnesota. He remained here only a few weeks, then returned to Europe. He did not return to Minneapolis to assume his post. He was succeeded by Dr. Julius P. Sedgwick.

Treatment was not further advanced than was diagnosis. Rest, fresh air, and an abundance of good food were the only essentials except for remedies for cough and pain. Sleeping porches began to burgeon on the fronts, backs, and sides of urban houses. Cabins in the country blossomed as resorts for the "lungers." No effective drug treatment was known. Robert Koch's prediction made in 1890 that "much more important is its (tuberculin's) curative action," was already well on the way to disproof. A few like Osler recognized the value of morale.

In 1904, there were only about 9,000 beds for patients with tuberculosis, and these as a rule were in small and mere nursing homes—not hospitals. Trudeau's Sanatorium, a cottage type, was the leading institution in this country. With its laboratories, it later became the mecca for everyone who desired to prepare for the care of the tuberculous.

Public Health activity in tuberculosis was just beginning. Only two states, Maryland and New Hampshire, had tuberculosis commissions. The

---

Presented at the Spring Meeting of the Minnesota Society of Internal Medicine, Minnesota, May 21, 1955.

first municipal ordinances requiring the reporting of tuberculosis had been enacted in New York City in 1897 under the aegis of Dr. Herman M. Biggs. Public health nursing was in its pioneering stage. As for voluntary associations of citizens to oppose tuberculosis, only eight had any money or active programs in 1904. The first and foremost was the Philadelphia Society founded in 1902 under the leadership of Dr. Lawrence M. Flick.

The attack on bovine tuberculosis had just begun. Pennsylvania, in 1895, had established a State Livestock Sanitary Board to supervise the health of domestic animals. The Pennsylvania plan later became the model for other states. Tuberculosis in cattle has been virtually eliminated in this country. In man, tuberculosis of lymph glands—scrofula—and tuberculosis of the spine, both of bovine origin, have almost disappeared here. Elimination of the disease in cattle has been of incalculable value to agriculture, and yet many can remember the bitter fight by farmers, especially in a neighboring state, before success was achieved. It has been many years since I saw a fresh case of scrofula; yet within the year one has appeared, pointing up the fact that vigilance must never be relaxed.

In the days from 1910 to about 1930, when private sanatoria cared for many of our patients, the cost of sanatorium care was a heavy added burden. Then, too, a patient might and sometimes did get the idea that he or she was kept for the sake of the income to the institution. Dr. Coons of River Pines in Stevens Point, Wisconsin, one day at a meeting in Washington, D. C., asked me why he had so little trouble keeping my patients as long as needed when so many others left against advice. I told him then of my plan to counter this unfortunate circumstance. In the first interview, at which I told my patient the diagnosis and advised sanatorium care. I took time to outline the procedures and the prospect.

I said that the time for cure might be short or it might be long. If long, it wasn't the fault of the medical man but because of the disease. One difficulty was that many patients left the sanatorium before recovery was complete and consequently relapse would occur, with total loss of all the time already spent. If recovery were satisfactory, there would be a day when the physician would say, "Now I believe that by such a date you will be ready to go home. You may notify your family to be ready." Here is where the mistake can be made. No living person, not even the physician, knows the exact date at which recovery is so complete and sure that relapse will not occur. Remember this: You are not being kept in that bed because they need the income from it. There are other people waiting for that same bed. In order to buy insurance against a relapse, I want you to look the doctor straight in the eye and say, "Doctor, won't you let me stay another month?"

Except for some progress in collapse therapy, diagnosis and treatment remained in about the state outlined above until eight years ago. Some success in the drug treatment of tuberculosis became apparent in 1947 with the use of streptomycin.

The part played by the drug treatments under study at the present time has had a tremendous impact on the mind, public as well as professional. The tendency is to class the streptomycins, PAS, and isoniazid among "miracle drugs." Those who know the problem recognize these drugs as only a part of a very complex curative program and still consider rest, diet, regimen and all the ancillary procedures of paramount importance. We may recall that it was hoped that the brilliant researches of Ehrlich would result in the eradication of syphilis. Yet within the past decade or more, penicillin has proved more efficacious in syphilis than the arsenicals of Ehrlich. We may hope for more efficacious remedies in tuberculosis.

A temptation into which patients and physicians are falling is to consider the "miracle" drugs the providential answer to their need and to use them as primary factors in cure instead of as adjuncts. It is true that these medicaments have changed the outlook where the individual lesion is small and the invading pathogen can be reached by the drug, as in miliary tuberculosis, tuberculous meningitis, in some cases of renal tuberculosis and in some tuberculous sinuses. Where, however, dense masses exist, where cavitation is advanced and where the organisms cannot be so reached, the problem is distinctly different, and specialized skill in treating the whole patient over a long and trying time is needed. The proper use today of the drugs is to condition the organisms and tissues surrounding the lesion so that surgical removal can be accomplished. In 1953, in Glen Lake Sanatorium, 175 pulmonary resections—

segmental or subsegmental lobectomy or pneumonectomy—were performed with two deaths, a mortality of only 1.14 per cent. In 1954, 146 successful operations were performed without an operative death.

The favorable results of the new drug treatment in sanatoria has resulted in an insistent clamor for the use of the drugs in the home. Here the control and supervision are inadequate. Rest and food are not adequately controlled. More serious is the absence or inadequacy of rehabilitation, education, vocational guidance, occupational therapy and recreation. In Philadelphia and Cleveland, programs for home treatment by the new drugs are in operation. One views them with profound sympathy, for they are designed to supply the need of patients for whom there is not adequate provision for sanatorium beds. In Philadelphia, the program was begun on a limited basis on April 5, 1954, and later extended to cover the whole city.

A letter from the Chief of the Tuberculosis Control Section to Katherine Radabaugh Pearce under date of August 19, 1954, says, "In a very short time, it became apparent that there were serious defects in such a plan and that it was beginning to backfire on us to a certain extent." Details are not important here. Again, we must remember that the drugs are only an adjunct.

Very naturally, patients unaware of the fact or in their natural optimism unwilling to admit that the drugs are not a cure but only an adjunct, and relying on the glowing accounts in the public press, will choose to stay at home. They thus miss the real cure. It is my considered opinion that the physician, either the general practitioner or the internist not possessing long-time sanatorium training and facilities, should not allow himself to be drawn in by any importunity or circumstance to the home treatment of pulmonary tuberculosis by the new drugs now in our possession.

Reasons for this attitude may be stated briefly:

1. Even in the early case with the Mycobacterium in the sputum, it may take two or three months to convert from positive to negative with the elimination of the infectious state.

2. Too often the patient will cut his treatment short, either because he cannot afford to continue or because he does not believe it necessary to persist. The $15,000 which Perkins has estimated as the average cost of a case of pulmonary tuberculosis, together with the long-term reduction or absence of earning capacity, imposes a financial burden which few families or individuals can sustain. Even though hopefully begun, it has to be surrendered eventually with an impaired financial status hanging over the victim. It is in the public interest, therefore, that the community bear part or all of the expense in order that a cure may be wrought with restoration of the individual to productive earning capacity and to a non-infectious state.

3. Interruption or halting at any stage in the highly complex management is fatal to the complete success of the program. Without meticulous care and intimate knowledge of the processes of sensitization and immunity, the patient may be sensitized to the drugs. Without frequent studies in the laboratory, strains of the organism resistant to the drugs may develop. Immediate attention to these factors is necessary if catastrophe is to be avoided. The determination of types of anti-tuberculosis drugs, their combination and duration of use requires specialized knowledge on the part of the physician.

In a disease such as tuberculosis, where the advance or retreat of the malady is so slow, so insidious, and so masked, it requires constant supervision by skilled observers, trained in the field, to recognize the character of the changes going on.

This supervision must be continuous, uninterrupted and must operate for many years. After arrest of the disease appears to be complete, everyone—layman, social worker, physician—who has had an opportunity to study the progress of stabilization, of recovery, and of eventual return to self-support, has seen the catastrophies so readily occuring when mistakes are made because of inadequate supervision and control. To learn that after satisfactory recovery an economic recovery is also possible leads any competent person to aid the program in every way possible. Even though complete recovery may not be attainable in certain instances, the fact that plans properly organized for rehabilitation are in operation is of immense value as a morale builder. Medical staff supervision supplemented by rehabilitation, education, vocational guidance, occupational therapy, recreation and medical social service is the *sine qua non* of a successful attack on tuberculosis. The rehabilitation process should begin the moment the patient enters the sanatorium. It should be foremost in the plans for guidance of every patient whose recovery is possible.

It might be well, at this point, to consider for a moment the (1) recalcitrant, stubbornly defiant, and (2) the unco-operative patient.

1. The recalcitrant, stubbornly defiant group comprises alcoholics, which make up the majority, those with psychotic difficulties, and some of those sent in under compulsion by health authorities. These unfortunates can be and often are most prolific sources of spread of the infection, for they are defiant, reckless, without regard for others, and they defy all rules which would protect others as well as themselves. Kentucky state law now makes it a crime to expose others to communicable tuberculosis.

2. The unco-operative patient may be so because of an economic or family situation or from an emotional difficulty, such as depression, or simply ignorance. It should not be a matter for surprise that a well-ordered program for rehabilitation goes further than any other single factor in the treatment, to give courage, build morale, and secure co-operation.

Last May, while in London, I had an opportunity to discuss with Dr. R. R. Trail the Papworth Village and El Alamain rehabilitation projects. The principle in operation there is that the recovering and recovered tuberculosis victim spends the remainder of his or her life in these communities. Organization makes it possible for the community and its population to become self-supporting. Like some other segments of the British economy, such as general medical practice, this particular scheme may not be adapted to our economy. It does, however, point up the advantages of organization and supervision of rehabilitation.

In countries where civilization is advanced, as in our own, many infectious diseases are under fairly strict control. But note this: each has its specific method as in smallpox, plague, cholera, typhus, yellow fever and malaria. Those who live in advanced countries are outnumbered three to one by peoples living under conditions so primitive that disease still takes a terrific toll. Without the most extraordinary vigilance, victims and vectors of these diseases can be brought in by ship and by air in a few hours. No relaxation in the case-finding activities should be permitted; special attention should be given to groups and areas where the greater proportion of cases are found. All patients admitted to general and psychopathic hospitals; people in congested and poorly housed areas in cities; those in low income groups and in jails and on skid row; members of certain ethnic groups and transient labor groups, where the tuberculosis incidence is high—all need special attention.

I would like to outline, in the briefest form possible, the program which gives promise of success if faithfully carried out.

1. Find those harboring any trace of the disease. Here skin testing is the least expensive and can be used in mass form in schools, in industrial plants, in all sorts of organizations in districts and communities. Though less reliable, patch tests are less expensive than Mantoux, require less technically trained personnel and may be useful in certain groups. Follow-up of the positive cases leads to finding the infective case in the home, office or plant.

2. Intensify measures to find the infective case. Physicians still need to be taught to think of the disease in its early manifestations. Without chest x-ray, gastric washings, and in some situations bronchoscopy, the early minimal case may be missed. Mass x-ray surveys need to be speeded up and extended. Voluntary agencies have contributed immeasurably to this program, and its productiveness has been proved. Governmental agencies should now take a greater part.

3. When an infective case is found, prevent further spread of the disease from this source. Training the patient in the care of material discharged into the air is only partially effective. All sorts of failure occur. Isolation and care are the definitely effective measures. Here the sanatorium is the only final answer.

4. BCG vaccination of the nonreactors who are liable to unusual exposure—nurses and attendants in sanatoria and hospitals and others in any environment where a higher incidence of active tuberculosis is found. This should be voluntary. Early age is not a contraindication. Dr. Long states that "some of the most impressive results have been recorded in the vaccination of large groups of newborn infants."† A more highly protective vaccine may yet be found. Research for this continues.

---

†Esmund R. Long: Editorial. Ann. Int. Med., 41: 647-652 (September) 1954.

5. Research in all lines must continue—medical, social and economic. While governmental agencies may take part, the greater progress is made in the universities, the hospitals and sanatoria aided by funds provided by volunteer groups and individuals.

The cost of a case of tuberculosis has been estimated by Dr. James E. Perkins, Managing Director of the National Tuberculosis Association, to be about $15,000.* This includes medical care, compensation, pensions, relief payments and loss of wages but does not include the loss of potential future earnings. The reduction in time spent under the modern program will reduce this cost. In any case the cost is well repaid to the community when the patient is restored to productivity and is no longer a source of infection.

Although the program is not as yet completely stabilized or standardized, as of today the prospect of a cure in pulmonary tuberculosis is at hand. The definitive removal of the infective and infecting focus could not be thought of until the new anti-microbial remedies and the new methods of anesthesia and chest surgery had been developed. The program in each case is slow and requires infinite pains and skill—and a minimum of errors. The job before us is a difficult one and requires patient, unremitting labor. As we see it throughout the world, it seems an impossible one. As we come closer home, the results already achieved give us hope.

In St. Louis County, in Hennepin and Ramsey Counties, and in the State of Minnesota, elimination of infective tuberculous foci is going on at a rate never before achieved.

One task is to educate the law-making bodies of the profit to be secured to the citizens of Minnesota. Governmental agencies must be convinced of the social value of conquering tuberculosis. Tuberculosis Facilities Commissions have made recommendations to our Minnesota legislature calculated to use our present facilities to their fullest value. Halting advances have been made, but progress is disappointingly slow. Supporters of the program have not as yet exercised the pressure needful if the fullest use of even the present facilities is to be secured. Governmental bodies will respond only to popular demand. Voluntary agencies, including the medical profession, must enforce this demand.

Time alone will tell whether the new types of therapy, by which the cavitated and therefore infectious areas of lung are removed and the patient thereby relieved of his infecting tissue, are our final answer. The very promise leads many to relax their vigilance. Whether or not the answer is at hand, the need is for increased rather than lessened activity on the part of those interested in the welfare of the community.

---

*Perkins, James: The Stage is Set. National Tuberculosis Association.

REHABILITATION OF RECOVERED TUBERCULOSIS PATIENTS

"It's not what you are but what you may become that counts." This is the motto of the Minnesota Vocational Rehabilitation counselors. In addition to many other services, the counselors help prepare tuberculosis patients for normal, productive living.

"More than 50,000 men and women who have recovered from active tuberculosis have been trained for work and placed in a great variety of paying jobs by the State-Federal program for vocational rehabilitation since 1935," says a release from the Minnesota Tuberculosis and Health Association.

Minnesota Vocational Rehabilitation trained eighty-three recovered tuberculosis patients for jobs in 1954. Their estimated annual earnings were $220,312.

Recovered tuberculosis patients are often safer and more satisfactory employes and co-workers than those who have never been disabled. They have been taught to guard their health and report for regular tuberculosis check-ups. They are less likely to infect others than the apparently healthy person who does not receive regular medical examinations and who may have tuberculosis without knowing he is ill.

Employers have discovered that rehabilitated workers are absent from the job no more than workers who have no physical handicap. They do not jump from job to job. They have fewer disabling accidents on the job than do other employes.

"When a tuberculosis patient has properly recovered, received training, and is placed in the right job, he can do that job as well as anybody," the release concludes.

Seminar

BANTI'S SYNDROME

ANANDA S. PRASAD, M.D.
Minneapolis, Minnesota

THE term "splenic anemia" was introduced in 1866 to refer to cases of anemia in which the patient had splenomegaly but no frank evidence of leukemia. This term then obviously included cases of hemolytic anemia, aleukemic leukemia, Hodgkin's disease and several others, which were separated by Banti from the group of cases later known as Banti's syndrome.[1]

Review of Literature

Banti, in his earlier papers (1883, 1894, 1895, 1898, 1905, 1907) as cited by Reiff,[2] presented fifty cases with clinical and pathological findings, which were later grouped under "Banti's disease." The ages of the patients varied from twelve years to fifty-five years. The majority of the patients were close to thirty-five years of age. He stressed the fact that in these patients there was no evidence of any gastric disturbance, liver or biliary disease, malaria, lues or alcoholism. He described the clinical course as consisting of three stages—the first stage beginning with painless splenomegaly and the last stage characterized by cirrhosis and ascites. He also emphasized the fact that in earlier stages, no icterus, ascites or evidence of venous collateral circulation in the portal area was present.

He gave the hematological picture of eleven patients in whom he found hypochromic anemia and leukopenia. He stated, however, that erythrocytosis and normal leukocyte counts were found in some patients. He did a few bone marrow examinations which revealed hyperplastic marrow.

According to his descriptions, the spleen was invariably enlarged and he recorded 3000 gm. as the maximum weight. Adhesions between the spleen and the neighboring organs were noted. Typically, the cut surface of the spleen was firm and red, and small whitish knots, corresponding to malpighian follicles were seen. The capsule and the trabeculae were thickened. Thickening of the reticulum was marked so that it appeared almost homogenous or indistinctly fibrillar. This thickening was accompanied by narrowing of the interstices which eventually were reduced to minute cavities "dispersed in the sclerotic tissue." Because the lymph stroma retained its reticular or adenoid appearance, he termed this "fibroadenie." The sinuses were irregular and drawn together. A few follicles were described as normal but the rest contained periarterial rings of hyaline connective tissue. He found that initially follicular and pre-follicular segments were involved and later the extent of sclerotic zone progressed.

The liver, according to him, was involved in late stages and then it was indistinguishable from Laennec's cirrhosis. Changes in the gastrointestinal tract were secondary to cirrhosis.

He thought that an infectious agent was responsible for all these changes. He postulated that a toxin, elaborated either by the agent itself or as a product of altered splenic metabolism, spread through the splenic vein to the liver, thus accounting for the subsequent endophlebitis and cirrhosis.

He believed that the absence of icterus in the early stage, the large spleen in the presence of a grossly normal liver, and the fact that early splenectomy effected a cure were all evidences against cirrhosis being the cause of this condition.

He found that the spleens of patients with Laennec's cirrhosis showed congestion, dilatation of venous sinuses and absence of "fibroadenie" and that periarterial fibrosis was not marked, in contrast to the spleens of patients with "Banti's disease."

Development of interest in Banti's disease in

Dr. Prasad is a Medical Fellow, Department of Internal Medicine, University Hospital, Minneapolis, Minnesota.

From the Department of Internal Medicine, Veterans Administration Hospital, Minneapolis, and the University Hospital, Minneapolis, Minnesota.

Presented at the Medical Grand Rounds, Veterans Administration Hospital, Minneapolis, Minnesota.

America was due largely to two publications by Osler[23,24] in 1900 and 1902. He regarded conditions "to which an unusual number of labels have been attached" to be different stages of the same malady. Long duration, he thought, indicated a chronic toxic rather than an infectious process.

Warthin,[25] in 1904, published reports of two cases in which he was able to demonstrate portal obstruction leading to splenomegaly which resembled in all ways that of Banti's disease. Six years later, he collected from the literature all cases of portal obstruction and concluded that there was nothing in the clinical or pathological complex by which the cases of portal or splenic vein thrombosis could be separated from the cases of splenic anemia or Banti's disease.

Eppinger, in 1920 as cited by Reiff,[2] considered a long list of possible causes for portal obstruction. These included infections of the gastrointestinal tract or peritoneum; inflammation of the pancreas with fat necrosis, sometimes subsequent to syphilis; tuberculosis; puerperal sepsis or trauma; trauma to the vein itself; and compression or invasion of the vein by tumor. He considered primary portal thrombophlebitis, a condition similar in pathogenesis to atheromatous changes in the arteries, as a possible cause of thrombosis and obstruction, as well as primary liver disease, such as cirrhosis, terminating in obstruction of portal flow.

He studied twenty-three spleens removed surgically from patients thought to have Banti's syndrome on clinical grounds. He was unable, however, to demonstrate the histologic appearance described by Banti. He was also unable to observe the clinical stages which Banti described. He did report the case of an Albanian girl with splenomegaly which, according to him, satisfied all the clinical and pathological criteria for Banti's disease. That girl told him, before her death, that there were several persons like her in her country, suffering from the same disease. Partly due to this case and the girl's remarks, Eppinger concluded that Banti's disease had a geographic distribution and he did not deny its existence. He, however, thought that the splenomegaly resulting from portal obstruction was being incorrectly designated as Banti's disease.

Mennet,[26] in 1920, wrote that he was unable to find in Banti's description any change which did not occur in cirrhosis of the liver. Kauffmann,[27] in 1922, observed that the splenic sinuses were broadened in Laennec's cirrhosis and he thought that this was a specific difference between the spleen in cirrhosis and that in Banti's syndrome. Dürr[28] outlined a diagnostic triad for Banti's spleen which consisted of (1) sinus hyperplasia, (2) periarterial fibrosis and (3) "trabekela ufersplittering" which means modification of the architecture of the trabeculae. He noticed that from the irregular borders of these structures long tapering collagenous processes radiated into the pulp.

Naegeli[29] was unable to find any basis for distinguishing Banti's disease from ordinary cirrhosis of the liver. Klemperer[34] concluded from his own studies that the pathological picture produced by thrombosis of the portal vein was identical to that of Banti's disease.

Watson[30] studied the various forms of splenomegaly in 1929. He stated that the splenic sinuses in liver cirrhosis were wide and prominent in contrast to the narrow sinuses of primary splenic fibrosis or of splenic change secondary to known systemic disease.

Larrabee[31] believed that long continued passive congestion was the mechanism involved for splenic changes in Banti's disease.

Members of the spleen clinic of Presbyterian Hospital in New York[19,32,33] measured splenic vein pressure in eighteen patients with Banti's syndrome. The pressures ranged from 225 to 500 mm. of normal saline. The average was 363.5 mm. Obstruction was variously attributed to: (1) cirrhosis of the liver, (2) schistosomiasis, (3) thrombosis of the splenic vein, (4) cavernomatous transformation of the portal vein, (5) stenosis of portal vein and (6) undetermined causes. In their control group, which consisted of cases of hemolytic jaundice, Gaucher's disease, purpura, pancreatic adenoma, lymphoblastoma and splenomegaly of undetermined origin, the splenic vein pressure ranged between 70-360 mm. of normal saline, the average being 195.7 cm. The authors believed that a fundamental factor common to all cases of Banti's syndrome was portal venous obstruction.

Ravenna,[12] in 1943, proposed the theory that congestive splenomegaly is a result of primary lesions of the small splenic arteries which regulate the blood flow into the spleen (primary active congestion). He postulated that the regulatory power of the splenic arterioles is disturbed eliminating control over the inflow of blood and that the consequent congestive splenomegaly is the cause of circulatory disturbance in the portal bed.

Reiff,[2] in 1944, studied splenic sinuses by staining with azo-carmine. By this method he was able to distinguish the collapsed sinuses from bundles of collagen with fibroblastic nuclei. This distinction was impossible with hematoxylin and eosin or Dominici's stain. He thereby demonstrated that there was a marked increase of sinuses in the majority of spleens from patients with Banti's disease.

Wintrobe[1] believes that portal hypertension accounts for the development of Banti's syndrome. However, full acceptance of this view is difficult since an obstructive factor cannot be demonstrated in as many as 40 per cent of cases.[16] On the other hand, it is said that most of the time the site of obstruction is missed and overlooked.

Many animal experiments have failed to produce Banti's syndrome by partial or complete occlusion of the portal vein. However, when hepatic cirrhosis is produced in rabbits by manganese[20] or in dogs by means of silica[19] splenic enlargement and the picture of congestive splenomegaly develops. Probably an irritative factor also plays a rôle. It is possible that long standing portal obstruction rather than that caused by simple vascular occlusion is the important cause. Recently, Palmer et al[22] succeeded in producing splenomegaly, anemia, leukopenia and a mild thrombocytopenia in albino rats by intraperitoneal administration of methyl cellulose over a period of fifteen weeks. It is suggested that the syndrome produced by methyl cellulose may represent an experimental form of the process to which, in man, the term "secondary hypersplenism" has been applied.

Failure to demonstrate an obstructive factor in a number of cases and the fact that portal obstruction independent of splenic diseases has been observed in the absence of appreciable splenic enlargement support the concept that Banti's disease represents a primary disease of the spleen.

The concept of "hypersplenism" has been invoked to explain the hematological picture of Banti's disease.

A recent case report[6] concerns a child in whom umbilical sepsis developed and who later had multiple osteomyelitis and scattered subcutaneous abscesses (S. aureus). At the age of thirteen months, he had hematemesis. His spleen was very much enlarged. The liver was not enlarged. A splenectomy was performed and the pressure in the splenic vein was normal. The problem was whether the changes occurring in the liver and spleen had any relation to previous umbilical sepsis or whether the two processes were independent.

Recently, Banti's syndrome has been described, for the first time in veterinary literature[7] in a dog. On operation, they found an aneurysm of the splenic artery pressing on the vein, with splenic vein thrombosis, resulting in Banti's syndrome.

Tidy,[9] in a recent paper, stated that the size of the spleen has no influence on the anemia and leukopenia and that it is not the cause of hematemesis or of development of clinical cirrhosis and ascites. His conclusion was that the splenomegaly, the anemia and leukopenia and the cirrhosis develop independently of each other. If this is correct, there must be an agent which acts independently on the three structures.

McMichael[20] stated that the liver is always involved throughout the course, whether there is clinical evidence or not, and that the liver and spleen are both affected by the same factor but independently and not necessarily to the same extent.

Tidy, in 1952 as cited by Hauge,[11] advanced the theory that Banti's disease could be caused by RH incompatibility. Gerrard, however, believes that splenic enlargement could only be a rare sequel of RH isoimmunization. Recently, Banti's disease was recorded in two brothers but no blood group incompatibility was found in them.

Clinical Features

Most patients are under thirty-five, and symptoms may occur in childhood. In Banti's series, females predominated in a 2:1 ratio, but this has not been true in other series. Onset is usually insidious, but it may be sudden with hematemesis or melena. Gastrointestinal bleeding is present in 50 per cent of the cases. In other cases, there may be abdominal pain or discomfort or a left upper quadrant mass, or symptoms due to anemia may predominate. Flatulence, diarrhea, vague indigestion or even mild jaundice in association with abdominal pain and fever may appear. The spleen is usually big. The liver is moderately enlarged. Weight loss is not conspicuous. Anemia, which is normocytic, usually follows splenomegaly; however, after repeated hemorrhage it is hypochromic, microcytic in type. Cell fragility is normal or reduced in hypotonic saline solution. When cirrhosis is marked, the anemia may be macrocytic. Usually, there is leukopenia and thrombocytopenia. The bone marrow in early stages shows no abnormality. Limarzi[13] has reported myeloid hyperplasia in the earliest stages and maturation arrest of myeloid and megakaryocytic series later. In the presence of cirrhosis marked erythroid immaturity was found. Following hemorrhage, normoblastic hyperplasia is seen. Davidson[21] found achlorhydria in four of his eight patients.

The course of the disease may be prolonged and benign. However, at any time it may be interrupted by gastrointestinal hemorrhage, portomesenteric thrombosis or hepatitis. In other cases, there is a steady progression to hepatic insufficiency and signs of portal venous obstruction appear. Death is usually due to one of the complications mentioned above or an intercurrent unrelated disease.

In describing clinical features, Tidy[9] divided the patients into three different age groups: (1) those under ten years of age; (2) those between ten and twenty years; and (3) those in later decades. According to him, in the first group of cases, the hematemesis occurs when there is no enlargement of the spleen and no anemia, leaving hepatic cirrhosis as the only reasonable explanation. He indicated that the splenic enlargement is often not more than moderate; however, in three cases he found that the spleen extended down to the umbilicus. He stated that there is no relationship between the size of the spleen and subsequent prognosis, nor is there any between the prognosis and splenectomy. In two of his patients under eight years of age, the liver reached to the umbilicus, and in the third case it was easily palpable. According to him, the chance of survival up to twenty years in this group is very poor.

He described the second group of patients as having a less acute onset and course and a better prognosis. Hematemesis, in this group, is less fatal, and cirrhosis with ascites may be as common a cause of death.

In the last group, those patients in the later decades, there is splenomegaly with anemia and leukopenia. Hematemesis is not so serious and the duration may be many years with only minor disabilities.

From the above description, it seems that the changing picture may be produced by the same factor but of different grades of severity. Its effects are revealed by different structures as patients with the milder forms live on into adult life and the later decades. The severest grades cause death in early life, the brunt of the process falling on the liver and incidentally producing hematemesis in a body not yet possessing reserves of blood and of blood forming tissues. A less severe but still serious grade appears in adolescents and young adults. Mild grades in subjects who consequently survive into adult life have time to produce their action on the spleen and bone marrow. The hepatic lesions which are insufficient to produce early death are usually also insufficient to produce clinical manifestations of portal cirrhosis but are recognizable on pathological examination probably in every case.

Treatment

Anemia needs treatment. In cases of severe hemorrhage, blood transfusion may be required. Iron should be given in cases of hypochromic microcytic anemia. Splenectomy is a complex subject. At one time, this was considered the best treatment; however, conclusions were drawn without comparing results following splenectomy with the course of the disease in patients not operated upon. Immediate postoperative mortality has been reported as 10 to 38 per cent.[14] Subsequently, hemorrhage may recur in one-third to one-half of patients operated upon with the development of hepatic insufficiency or thrombosis in the portal area. In Howell's[15] comparison of fifty-one patients subjected to splenectomy and forty-three patients without splenectomy, no difference between the two groups could be demonstrated in regard to expectation of life, development of hepatic dysfunction, or occurrence of hematemesis.

However, studies at the spleen clinic at Presbyterian Hospital in New York[16,17,18] indicated that more careful selection of patients for splenectomy has resulted in better operative results. It has been stated that the surgeon should not perform splenectomy in Banti's syndrome unless he is prepared to do a splenorenal anastomosis as this may be the only opportunity to construct a satisfactory shunt. In general, abdominal exploration seems advisable in many cases of congestive splenomegaly.

A few contraindications for splenectomy have been suggested.[3] These are:

1. It is rarely justified in progressive decompensating liver disease.
2. It is not justified in the presence of a preoperative thrombocytosis.
3. It is not justified if bone marrow shows evidence of a toxic depression rather than the characteristic hyperplasia.
4. It is contraindicated in the presence of an erythroblastic bone marrow with a reversal of the myeloid-erythroid ratio.
5. It is contraindicated in children whose blood picture is not typical of this disease.
6. Lastly, a severe degree of anemia may also be an immediate contraindication for operation.

According to a recent article,[8] the following are considered as indicating serious operative risk for the porto-caval shunt procedure:

1. Plasma albumin below 3 gms.
2. Ascites which fails to respond to medical therapy.
3. Cephalin-cholesterol flocculation test results of 3 plus in 24 hours and 4 plus in 48 hours.
4. Prothrombin time prolonged more than four seconds above normal after adequate Vitamin K therapy.
5. Elevated serum bilirubin.
6. Bromsulfalein retention greater than 10 per cent in half an hour.

Several procedures are available for porto-caval shunt, the discussion of which is beyond the scope of this paper.

References

1. Wintrobe, M. M.: Clinical Haematology, 3rd Edition, 1951.
2. Reiff, Robert H.: Ph.D. Thesis, University of Minnesota, 1944.
3. Durham, Robert H.: Ann. Int. Med., 34:6 (June) 1951.
4. Ben, Geurs: Medical Grand Rounds, VA Hospital, 1: No. 33, 1948.
5. Ralph, Silas: Medical Grand Rounds, VA Hospital, 3: No. 5, 1949.
6. Stokes, L.: M. J. Australia, 1:13 (March 28) 1953.
7. Marshak, R. R.: J. Am. Vet. M. A., 123:917 (Aug.) 1953.
8. Linton, Robert R.: Ann. Surg., 134:3 (Sept.) 1951.
9. Tidy, Sir Henry: Brit. Med. J., 2:4774 (July 5) 1952.
10. Hunt, A. H.: Brit. M. J., 2:4774 (July 5) 1952.
11. Hauge, Mogens: Brit. M. J., 2:4788 (Oct. 11) 1952.
12. Ravenna, P.: Arch. Int. Med., 66:879, 1940.
13. Limarzi, L. R., et al: Am. J. Clin. Path., 13:231, 1943.
14. Pemberton, J., et al: Ann. Surg., 94:755, 1931.
15. Howells, L.: Lancet, 1:1320, 1938.
16. Rousselot, L. M.: J.A.M.A., 140:282, 1949.
17. Rousselot, L. M.: Surgery, 8:34, 1940.
18. Thompson, W. P.: Ann. Int. Med., 14:255, 1940.
19. Rousselot, L. M., and Thompson, W. P.: Proc. Soc. Exper. Biol. & Med., 40:705, 1939.
20. McMichael, J.: J. Path. & Bact., 39:481, 1934.
21. Davidson, L. S. P.: Lancet, 1:593, 1934.
22. Palmer, J. G., Eichwald, E. J., Cartwright, G. E., Wintrobe, M. M.: Blood, 8: No. 1 (Jan.) 1953.
23. Osler, W.: Am. J. M. Sc., 119:54, 1900.
24. Osler, W.: Am. J. M. Sc., 124:751, 1902.
25. Warthin, A. S.: Internat. Clin., 4:189, 1910.
26. Mennet, J.: Virchows Arch. f. Path. Anat., 227:266, 1920.
27. Kaufmann, E.: Anatomie. Berlin: Walter de Gruyter Co., 1922.
28. Dürr, R.: Beitr. z. Path. Anat., 72:418, 1924.
29. Naegeli, O.: Verhandl. d. deutsch. path. Gesellsch., 23:39, 1928.
30. Watson, C. J.: Folia Haematol., 39:102, 1929.
31. Larrabee, R. C.: Am. J. M. Sc., 188:745, 1934.
32. Rousselot, L. M.: J.A.MA., 107:1788, 1936.
33. Rousselot, L. M.: Bull. New York Acad. Med., 15:188, 1939.
34. Klemperer, P.: Am. J. Clin. Path., 6:99, 1936.

THREE-INJECTION METHOD FOR SALK VACCINE CONTINUED

A technical committee on the Salk poliomyelitis vaccine has agreed unanimously, and Department of HEW officials have concurred, that the present system of three injections should be continued. The group rejected a proposal for a single injection to get the limited supply to more children. PHS Surgeon General Scheele summed up for the committee in these words: "Although it is evident that the injection of 1 cc produces a marked degree of immunity, it was found that there is not enough scientific evidence on the duration of immunity after a single dose to lead to any recommendation for a change in the present dosage."

Accordingly, this remains the procedure: two injections, with the second following four to six weeks after the initial dose or as soon thereafter as possible; then a booster shot seven months or later after the second injection. Each shot 1 cc.

PHS's Poliomyelitis Surveillance Unit presented figures to the conferees on single injections which purported to show 69 per cent effectiveness in seven reporting states (of 1,490,459 children vaccinated in these states, only fifty-eight had paralytic polio, while of 1,789,651 unvaccinated children, 325 had paralytic polio). The states under study were New York, California, Colorado, Illinois, Maryland, Minnesota and Missouri. Dr. Jonas Salk, developer of the vaccine, demonstrated on the other hand that a second injection followed by the booster markedly increases the degree of immunity. In conclusion, the group of experts agreed to stand by the present system because, among other reasons, (1) a higher incidence of polio occurs in lower age groups and efforts should be concentrated there, and (2) difficulties possibly would arise in re-educating physicians and parents on any change.—*AMA Washington Letter*, Dec. 9, 1955.

Case Presentations

Hematoma of the Retropharyngeal Space Causing Tracheal and Esophageal Obstruction

JOSIAH FULLER, M.D.,
FRANK J. HIRSCHBOECK, M.D.,
and ROBERT H. LABREE, M.D.
Duluth, Minnesota

THE retropharyngeal space frequently receives the attention of the endoscopist because it is the area first involved in mediastinitis following esophagoscopic perforation of the cervical esophagus. This potential space is described in Gray's anatomy[1] as being limited posteriorly by the prevertebral fascia, laterally by the investment of the carotid sheaths by the same fascia and anteriorly by the buccopharyngeal fascia covering the posterior aspect of the pharynx and the esophagus. It extends from the base of the skull down into the posterior mediastinum.

Although inflammatory involvement of this potential space is not uncommon, it is exceedingly rare to find it distended with blood. Spontaneous hemorrhage in the neck causing respiratory obstruction in hemophiliacs has been reported.[2,3] The following case report describes a patient with a post traumatic hematoma of the retropharyngeal space causing tracheal and esophageal obstruction.

Case Report

An eighty-two-year-old widow was admitted to the hospital because of acute dyspnea. The past history revealed that for eight years, the patient had been under care because of chronic heart failure with recurrent attacks of myocardial insufficiency due to generalized arteriosclerosis with mild hypertension, 150/100. During the period of continuous observation, she was treated with digitalis, a low sodium diet and ammonium chloride. Because of failure to follow all therapeutic injunctions, the patient occasionally had need of additional dehydration with a mercurial diuretic. Except for stasis ulcers of the left leg due to chronic venous insufficiency, no other significant illness was found in the previous medical history.

The patient stated that about twenty hours previous to admission to the hospital, she fell at home. This caused no apparent difficulty until about seven hours before admission when she began to have pain in the left side of her neck. Two hours before admission, she noted onset of swelling in her neck which rapidly increased in severity and was associated with respiratory difficulty. The examination in the emergency room revealed an elderly woman in severe respiratory distress. There was marked inspiratory stridor and in order to have any airway, she had to sit up straight with her chin thrown forward. There were also multiple bruises over the front and back of her trunk. The tense swelling in her neck extended laterally to both sternocleidomastoid muscles and from her chin to her clavicles.

X-ray of the cervical spine failed to reveal a fracture but the lateral film showed a very marked widening of the retropharyngeal space (Fig. 1). Because of the history of a recent fall and the tenseness of the swelling, this was assumed to be due to hemorrhage. However, the immediate problem was the necessity for establishment of an airway. A tracheotomy was done with prompt relief of her respiratory distress. After this, it was apparent that the patient was unable to swallow. Liquids would not pass down and attempts at passing a stomach tube met an obstruction in the lower pharynx. It was possible to see the hematoma bulging through the posterior pharyngeal wall.

The patient's fluid and electrolyte balance was maintained intravenously for a few days. Hematologic evaluation failed to reveal any abnormality of the clotting mechanism. Although it was apparent that the active bleeding had stopped, there was a steady extension of the cervical ecchymosis to involve the chest, breasts and trunk. A film taken at this time revealed that the hematoma was smaller (Fig. 2). However, it was apparent that there would be many days before this blood clot would become small enough to allow her to swallow. Therefore, nine days after admission, a left anterior cervical mediastinotomy was performed. This was done in the usual manner through an incision along the anterior border of the sternocleidomastoid muscle. The dissection was carried through the deep fascia above the omohyoid muscle, medial to the carotid sheath and lateral to the thyroid gland. The buccopharyngeal fascia was tense and bulging. Beneath this fascia was found a space containing an estimated 300 cc. of clotted blood. After the hematoma was evacuated, it was possible to palpate up into the pharynx behind the posterior pharyngeal wall and down into the mediastinum behind the esophagus.

After the mediastinotomy, the patient made slow but steady improvement. The tracheotomy tube was removed two days later and she was dismissed from the hospital ten days after that. An x-ray film taken five days after the mediastinotomy revealed a marked reduction in the

---

From the Department of Surgery and Internal Medicine of the Duluth Clinic.

width of the retropharyngeal space (Fig. 3). The patient's subsequent course was uneventful and she was able to swallow all types of food without difficulty.

Attempts at explaining the source of this hemorrhage are purely speculative. If attention is directed to the illustrations, one may note the scattered calcifications about the neck. It can be assumed that some of these calcifications are in her markedly arteriosclerotic blood vessels. It is conceivable that torsion on one of these pipe-stem vessels during the fall caused a fracture of the vessel wall and the subsequent hemorrhage.

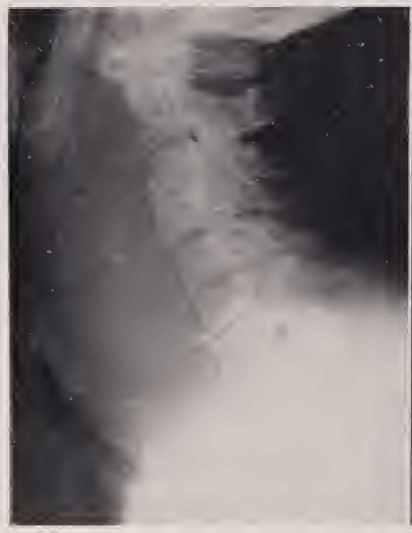


Fig. 1. Lateral view of neck taken on admission, showing marked widening of the retropharyngeal space.

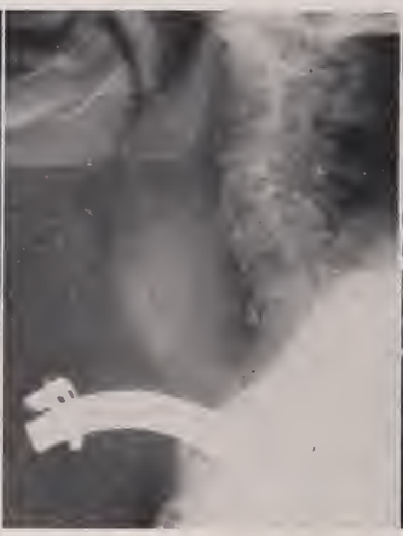


Fig. 2. Lateral film of neck taken eight days after admission. There has been some decrease in the width of the retropharyngeal space. Tracheotomy tube is in place.

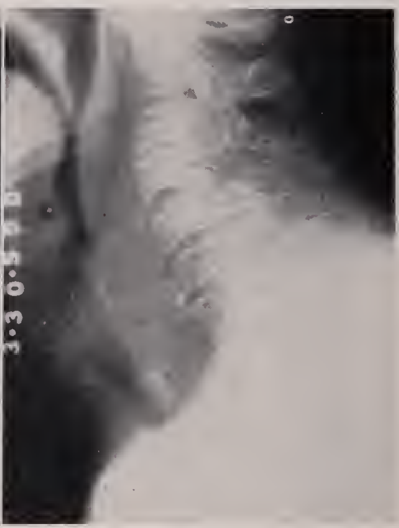


Fig. 3. Lateral film of neck taken five days after anterior cervical mediastinotomy. Tracheotomy tube has been removed and there is reduction in the width of the retropharyngeal space.

Summary

A case is reported in which an eighty-two-year-old woman in chronic congestive heart failure developed, following a fall, tracheal and esophageal obstruction from a hematoma in the retropharyngeal space. The patient was treated successfully by an emergency tracheotomy and a later anterior cervical mediastinotomy.

References

1. Gray, H. Revised by Lewis, W. H.: Anatomy of the Human Body. 23rd edition, p. 383. Philadelphia: Lea and Febiger, 1936.
2. Boyd, W. H. F.: Respiratory obstruction in hemophilia; recovery after intubation. Lancet, 1:302-303 (Feb. 18) 1950.
3. Baird, K. H., and Fox, M. S.: Severe sublingual and peritracheal hemorrhage in hemophilia with recovery following tracheotomy. J. Pediatrics, 23:90-94, 1943.

STUDY OF THYROID HORMONE

Three major diagnostic laboratory methods are available in the estimation of thyroid activity, said Dr. Keith P. Russell, Assistant Clinical Professor of Obstetrics and Gynecology, University of Southern California, speaking before the Fourth Annual Clinical Meeting of The American Academy of Obstetrics and Gynecology held in Chicago in December. Dr. Russell said that the PBI Test (protein-bound iodine) of the serum or plasma has been shown to be an accurate index of circulating thyroid hormone, and at present is the most widely used single test of thyroid function. The PBI Test measures the amount of the hormone (thyroxine) being put out by the gland.

Dr. Russell described the radioactive iodine test (I 131), as the test that measures the functional capability of the gland itself. The third and last method described was the basal metabolic rate (BMR), which measures the effect of thyroxine on the metabolic function of the patient's cells, its action on the body tissues.

Dr. Russell summed up the three methods by concluding that each one measures a different facet of the total function. Therefore, all three are of major importance in the detection and management of thyroid gland problems.

Locked Twins, Chin to Chin, Obstructing Labor

CHARLES H. McKENZIE, M.D., and
HENRY W. QUIST, JR., M.D.
Minneapolis, Minnesota

THE condition of chin-to-chin locking in twins, causing obstructed labor, is almost as rare as flying saucers. The quoted incidence of one such occurrence in 90,000 labors stems from the remark by Braun that he remembered only one such case in 90,000 deliveries in Vienna. In Minneapolis, in the past fifteen years there have been about 250,000 deliveries; the case to be presented appears to be the only such case, or one in 250,000 labors.

In reviewing the literature from 1912, only twenty-four cases of chin-to-chin locked twins have been found (Table I). Lawrence, in a report of a case in 1949 found fifteen previous reports. These have all been confirmed and eight more reports found to 1954. Four or five other references are presently unavailable. Less than thirty cases have been reported in the past forty years.

TABLE I.

Year	Author	Gravida	Treatment of Locking	Weights of Twins	Results	Type
1912	MacDonald[1]	1	1. Decapitation 2. Forceps	1. Large 2. Large	1. S.B. 2. A.	Binovular
1926	Gehse[2]	1	1. Decapitation 2. Forceps	1. 4 lbs. 10 oz. 2. 5 lbs. 2 oz.	1. S.B. 2. A.	Not Stated
1928	Hunter[3]	1	1. Decapitation 2. Forceps	1. 4 lbs. 12 oz. 2. 3 lbs. 4 oz.	1. S.B. 2. A.	Uniovular
1933	Moore[4]	1	Disengagement 1. Breech extraction 2. Forceps	1. 4 lbs. 2. 5 lbs. 3 oz.	1. S.B. 2. A.	Binovular
1937	Spence[5]	1	Disengagement 1. Breech extraction 2. Forceps	1. Not stated 2. 5 lbs. 1 oz.	1. S.B. 2. A.	Uniovular
1937	Whitfield[6]	1	1. Decapitation 2. Forceps	1. 4 lbs. 2. 4 lbs.	1. S.B. 2. A.	Binovular
1937	Peters[7]	1	Cesarean	1. 5 lbs. 4½ oz. 2. 4 lbs. 6½ oz.	1. A. 2. A.	Uniovular
1938	Russell[8]	1	Disengagement 1. Breech extraction 2. Version and extraction	1. 4 lbs. 2. 3 lbs. 12 oz.	1. S.B. 2. A.	Not Stated
1938	Te Groen[9]	3	1. Decapitation 2. Version and extraction	1. 4 lbs. 4½ oz. 2. 4 lbs. 5 oz.	1. S.B. 2. A.	Binovular
1938	Bowles[10]	1	1. Decapitation 2. Spontaneous delivery	1. 4 lbs. 2. 4 lbs. 12 oz.	1. S.B. 2. S.B.	Uniovular
1942	Nicolson[11]	1	1. Decapitation 2. Forceps	1. 3 lbs. 9 oz. 2. 3 lbs. 6 oz.	1. S.B. 2. A.	Uniovular
1942	Wright[12]	1	Disengagement 1. Breech extraction 2. Forceps	1. 4 lbs. 1 oz. 2. 4 lbs. 11 oz.	1. S.B. 2. S.B.	Binovular
1942	Wright[12]	1	1. Decapitation 2. Forceps	1. 4 lbs. 10 oz. 2. 2 lbs. 13 oz.	1. S.B. 2. S.B.	Binovular
1944	Bradlow[13]	2	Disengagement 1. Breech extraction 2. Version and breech extraction	1. 5 lbs. 3 oz. 2. 4 lbs. 4 oz.	1. A. 2. A.	Uniovular
1944	Love[14]	1	Disengagement 1. Breech extraction 2. Spontaneous vertex	1. 3 lbs. 2. 3 lbs.	1. S.B. 2. A.	Uniovular
1946	Greig[15]	2	Disengagement 1. Breech extraction 2. Spontaneous	1. 4 lbs. 10 oz. 2. 5 lbs. 2 oz.	1. A. 2. A.	Uniovular
1949	Lawrence[16]	1	1. Decapitation 2. Forceps	1. 6 lbs. 2. 4 lbs. 7 oz.	1. S.B. 2. A.	Binovular
1947	Geggie[17]	11	1. Decapitation 2. Spontaneous	1. Not stated 2. Not stated	1. S.B. 2. S.B.	Binovular
1950	Kimball and Rand[18]	3	1. Breech extraction 2. Piper forceps	1. 4 lbs. 4 oz. 2. 4 lbs. 6 oz.	1. A. 2. A.	
1951	Stenstrom[19]	2	1. Decapitation 2. Forceps	1. Not stated 2. Not stated		
1951	Lattuada[20]	1	Cesarean	1. Not stated 2. Not stated	1. N.N.D. 2. A.	Binovular
1951	McIntyre and Barr[21]	1	1. Head of second twin pushed up 2. Version and extraction	1. 3 lbs. 15 oz. 2. 3 lbs. 10 oz.	1. S.B. 2. A.	Uniovular
1951	McIntyre and Barr[21]	1	1. Head pushed up 2. Spontaneous	1. 3 lbs. 12 oz. 2. 6 lbs. 10 oz.	1. S.B. 2. A.	Uniovular
1953	Friedman[22]	3	1. Head pushed up 2. Version and extraction	1. 4 lbs. 9 oz. 2. 8 lbs. 3 oz.	1. A. 2. A.	

From The Department of Obstetrics and Gynecology, Swedish Hospital, Minneapolis, Minnesota.

Treatment

The treatment of the locked heads depends on (1) the size of the fetuses and (2) the stage of labor. Beck,[24] DeLee,[25] and Titus[23] all state that if disengagement is not effected under deep anesthesia, decapitation of the first twin is indicated. However, Greenhill,[25] in the last edition notes "the condition would be ideal for laparotracheotomy as the opening in the uterus is immediately over the interlocked heads."

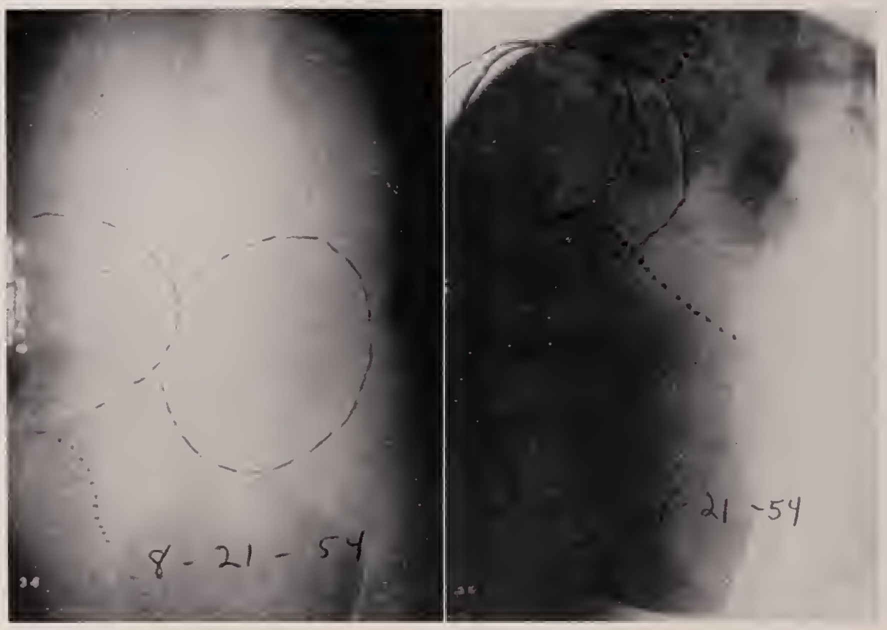


Fig. 1.

Kimball and Rand[18] ingeniously applied Piper forceps to the second head of small (4 pound) twins and delivered both alive. In the series presented eleven decapitations were done, disengagement was successful in three cases (six babies born alive), cesarean section was successful in two cases (four babies born alive, one neonatal death). The maternal mortality was 0 per cent but the fetal mortality (twenty-three stillborn, one neonatal death) was 50 per cent.

One can readily understand now the reason for the paucity of reports. We are therefore pleased to report the following case in which identical twin boys weighing a total of 14 pounds were delivered alive and well.

Case Report

Mrs. V. M., aged nineteen, gravida 1, had a due date of August 19, 1954. There was a family history of twins. She had a normal pregnancy, with a weight gain of 20 pounds. A flat plate of the abdomen on August 4 showed twins, one breech and one cephalic. There was a spontaneous onset of labor at 11:30 p.m. on August 19, 1954. The membranes ruptured spontaneously at 2:15 a.m. on August 20. She had mild contractions all day and was well sedated. A vaginal examination in evening of August 20 showed the cervix completely dilated, with breech at the spines. The patient was fatigued but not exhausted. In a telephone consultation, locked twins were discussed but considered improbable. The patient slept all night with no contractions.

TABLE II

Chin-to-chin locked twins	24
Gravida 1	17
Decapitation	11
Stillborn	23
Neonatal death	1
Uniovular	10
Mortality	
Maternal	0%
Fetal	50%

An x-ray at 8:00 a.m. on August 21 (thirty-two and one-half hours since the onset of labor, twelve hours in the second stage) showed chin-to-chin locked twins. Both fetal heart tones were heard.

Cesarean section was done from 11:10 a.m. to 12:15 p.m. on August 21 under spinal anesthesia (procaine 80 mg.). A transverse low incision was made in the uterus. The first twin was extracted by breech but the chin was unlocked manually with difficulty. The second twin, cephalic, was readily pushed through the incision. Both were males, the first weighing 6 pounds 15½ ounces, the second 7 pounds ½ ounce. There was a uniovular placenta, indicating identical twins. The patient had an uneventful afebrile recovery. The mother and babies were discharged on the eighth post-partum day.

(Continued on Page 45)

Laboratory Aids

Sponsored by
The Minnesota Society
of Clinical Pathologists
George G. Stilwell, Editor

ACUTE INFECTIOUS HEPATITIS: LABORATORY AIDS IN MANAGEMENT

GEORGE G. STILWELL, M.D.
Rochester, Minnesota

Acute infectious hepatitis, formerly known as catarrhal jaundice, has become an increasingly familiar problem to physicians during the past few years. In spite of the accelerated experience with this viral disease, many hiatuses exist in knowledge of its pathogenesis and epidemiology. The incidence of infectious hepatitis apparently is increasing at a rapid rate. In 1951, a total of 7,349 cases was reported in the United States. After the disease was added to the list of reportable conditions in 1952, the total jumped to 17,428 cases in that year. Approximately 50,000 cases were reported in 1954. Infectious hepatitis may occur in persons of any age and at any time of the year. Because its viral origin was recognized relatively recently, control measures have not yet evolved.

Two forms of viral hepatitis are encountered, namely, acute infectious hepatitis and serum hepatitis, the latter being transmitted by syringes, needles or blood contaminated with the virus. In the former variety, the virus appears in both blood and feces, whereas it is apparently present only in blood in serum hepatitis. The signs and symptoms in these two forms of the disease are similar, and routine laboratory tests cannot differentiate the two varieties. Most instances of acute infectious hepatitis probably occur as the result of spread from person to person, but relatively explosive outbreaks have appeared, suggesting transmission by contaminated food or water or both. Chronic carriers of the virus of infectious hepatitis possibly exist; it is suggested that perhaps 0.2 per cent of the general population carry the virus of serum hepatitis in their blood.

Diagnosis

One of the outstanding hallmarks of infectious hepatitis is the extreme fatigability, which may incapacitate the patient and which may be present for some time before jaundice occurs. The appearance of hepatomegaly and jaundice directs attention to the liver after the nonspecific prodromal signs and symptoms have been present for varying periods. Chills and fever frequently precede the jaundice by several days. Acute infectious hepatitis usually runs a self-limited and benign course of thirty to sixty days.

A most important factor in the management of infectious hepatitis is the recognition of impending hepatic insufficiency. For this purpose it is impossible to substitute laboratory data for the continued careful clinical observation of patients who have hepatic disease. The signs on which a prediction of impending hepatic coma can be based include an increase in abdominal distention, deepening of the jaundice, appearance of peripheral edema, onset of muscular twitchings and the occurrence of fresh spider angiomas. A peculiar odor of the breath, the so-called fetor hepaticus, may appear; this is a sweetish, not unpleasant odor probably caused by a tertiary amine and resembling the aroma of alpha methyl piperidine.

It is evident, then, that laboratory tests have a supplemental place in the original diagnosis of hepatitis and in the detection of impending hepatic insufficiency. Use of liver function tests does show the extent of hepatic damage but may not allow differentiation of the various types of hepatitis. The excretory function of the liver may be evaluated by such procedures as the measurement of total serum bilirubin, the amount of bilirubin in the urine, the degree of retention of sulfobromophthalein in the blood and the value for serum phosphatase. The functional state of the hepatic cells themselves may be gauged by the various flocculation and turbidity tests, such as cephalin-

---

From the Section of Publications, Mayo Clinic, Rochester, Minnesota.

This is the thirty-fifth in a series of editorial reports sponsored by the Minnesota Society of Clinical Pathologists and designed to foster closer relationships between laboratory physicians and their colleagues.

cholesterol flocculation, thymol turbidity and zinc sulfate turbidity, urinary urobilinogen, "prothrombin time," blood cholesterol, serum proteins and the synthesis of hippuric acid. Other tests that may be used include phenol turbidity, colloidal red, serum cholinesterase and measurement of gamma globulin.

If the results of most or all of these tests indicate hepatic dysfunction and if the patient has hepatomegaly and anorexia, the diagnosis probably is hepatitis. With negative cephalin-cholesterol flocculation and thymol turbidity and with normal or decreased urinary urobilinogen, biliary obstruction is more likely to be present. When the diagnosis remains doubtful despite thorough clinical and laboratory investigation, the physician is warranted in doing hepatic biopsy. The characteristic histopathologic features of viral hepatitis usually can be differentiated from the changes associated with extrahepatic obstructive jaundice.

As already indicated, laboratory procedures are of value as supplemental evidence of imminent hepatic insufficiency. Unfavorable changes in hepatic function may be indicated by (1) sudden or steady increase in the value of serum bilirubin, (2) sudden or steady decrease in urinary output, (3) sudden leukocytosis, which often is indicative of increased destruction of the hepatic parenchyma, (4) persistent reduction in the amount of serum albumin, (5) sudden or steady lengthening of the "prothrombin time" and (6) decrease in serum cholinesterase.

Laboratory Tests During Convalescence in Infectious Hepatitis

Probably the most important role of laboratory tests in infectious hepatitis is the aid they give in the management of the convalescent phase of the disease. Most tests of hepatic function are of little or no value during the acute stages of the illness, when the patient is jaundiced and obviously sick. However, such tests are of great value later in the course of the disease, when complaints are minimal or absent and abnormalities are not found on physical examination. These tests should be performed at regular intervals during convalescence, so that significant changes, either progressive or regressive in nature, will become readily apparent.

Analysis of the large battery of tests of hepatic function that are available indicate that three procedures are of prime importance in such a program. These are the sulfobromophthalein test, the thymol turbidity test and measurement of total serum bilirubin. Use of these three tests is adequate to demonstrate persistent or recurrent hepatic dysfunction throughout the period of convalescence in infectious hepatitis. The cephalin-cholesterol flocculation procedure is also of value according to many workers, although others state that it is insensitive in later phases of the disease and thus may be misleading.

Retention of sulfobromophthalein is undoubtedly the most sensitive indicator of hepatic dysfunction after jaundice has disappeared. As many as 35 per cent of patients still have definitely abnormal retention of this dye as long as seven weeks after jaundice has gone. At the same time, the thymol turbidity test may show positive results in about 25 per cent of convalescents, as does the zinc sulfate turbidity test, whereas the results of practically all other tests of hepatic function may be normal except for a few scattered positive reactions. The amount of total serum bilirubin also should be determined weekly during convalescence, even though the sulfobromophthalein test is a more sensitive indicator of a relapse.

By periodic use of these tests, the physician can minimize the dangers of allowing the patient to resume full activity too early and can detect impending relapse at the earliest possible moment. Conversely, such studies will avoid unnecessary prolongation of rest in bed and an undue delay in the return to full activity, factors that may be of particular importance to military personnel.

Because of the aforementioned self-limited nature and the usual benignancy of infectious hepatitis, conservative management is used almost universally. The two main factors in this regimen have been a high-protein, high-carbohydrate diet and adequate rest in bed. Some recent surveys tend to minimize the importance of a strict diet and undue restriction of activities.

Investigators associated with the Armed Forces have recommended the following program of management of infectious hepatitis, governed by the results of laboratory tests.

1. The patient is confined in the hospital or at home and stays in bed if he feels sick. He may get up if he feels able, except that he must rest for 1 hour after each meal.

2. The total serum bilirubin is determined regularly until it is less than 1.5 mg. per 100 ml.

(Continued on Page 68)

Current Concepts

THE VALUE OF PROLONGED ANTICOAGULANT THERAPY

JOSEPH F. BORG, M.D.
Saint Paul, Minnesota

Since the contributions of Wright[1] and coworkers and Nichol and Borg[2] concerning prolonged anticoagulant therapy, many favorable reports have appeared. Such treatment has received increasing acceptance in many thromboembolic conditions.

1. *Recurrent embolization associated with rheumatic heart disease and auricular fibrillation.* This complication, especially when associated with cardiomegaly and stubborn decompensation, occurs much less frequently when patients are kept on prolonged anticoagulant therapy. These patients are especially susceptible to such recurrences, and treatment should be continued indefinitely. With a relatively small heart and easily controlled compensation, some investigators suggest that therapy may be stopped after about six months.

2. *Recurrent pulmonary infarction, thrombotic or embolic.* This condition, frequently of unknown cause, may be a serious condition leading to pulmonary suppuration and its dangerous complications. It may simulate pneumonia and should always be suspected in a patient with heart disease when an unexplained break in compensation appears. Often unrecognized, it occurs so often in congestive heart failure that the use of anticoagulants in this group of patients is widely advised. Treatment should be discontinued only when all possible causes seem likely to be under control.

3. *Multiple arterial occlusions, thrombotic or embolic, occurring anywhere in the body regardless of cause.* These may occur especially in angiitis, arteriosclerosis, or heart disease with associated mural thrombi, and their recurrence lead to crippling conditions. With our present knowledge, it is probably better to exclude emboli from bacterial endocarditis from this category. Treatment should be continued until the cause is determined to be probably inactive.

4. *Recurrent thrombophlebitis, especially when occurring at rather short intervals of time.* These conditions occur usually in the lower extremities and may be deep or superficial. If treatment seems ineffective, consideration of the possibility of malignancy, especially obscure visceral carcinoma, must not be overlooked. Therapy should be continued several months after the cause is apparently under control.

5. *Myocardial infarction.* The frequency of recurrence of this condition, especially in the first two years after an initial attack, has led to an increasing acceptance of prophylactic long-term anticoagulant therapy. Recurrences and thromboembolic complications appear to occur much less frequently in the treated groups. These observations must be confirmed by others with much larger series of patients before it can be regarded as conclusive. Personal experience with the use of ambulatory anticoagulant therapy over the past eight years has prompted continuance of this therapy and its recommendation to others. Treatment should be maintained at least two years, probably indefinitely.

6. *Impending myocardial infarction.* Prevention of an initial myocardial infarction is considered by many to be sufficiently likely in a certain group of patients to justify anticoagulant therapy to be continued over a long period. This group includes (1) those patients who with no history of previous cardiac pain begin a series of spells of moderate cardiac distress without significant provocation and (2) a group of angina pectoris patients who abruptly begin to have increased frequency and severity of attacks. The recognition of these groups supplies the only hope available for forecasting an infarction, and it is my opinion, among others, that such patients be immediately started on anticoagulant therapy and treated as a myocardial infarction until the course makes sufficiently clear that myocardial necrosis has not occurred. Prolonged therapy is as justifiable in these cases as in those who have had a demonstrable infarction.

Details of management of therapy, selection of anticoagulants, contraindication and discussion of hemorrhagic complications must be sought elsewhere.[1,3,4] The risk in well-controlled anti-

(Continued on Page 61)

Editorials

John F. Briggs, M.D.
Arthur H. Wells, M.D.
Henry G. Moehring, M.D.

VIVE LA DIFFERENCE

A December issue of *Life* magazine tells us about the pre-Presidential nomination activities of Adlai Stevenson, and about the effectiveness of the Democratic-Farmer-Labor political party in stirring up political interest; for example, in Duluth even the hospitals were canvassed—except, of course, the hospital that was the home of the rich Republicans. We understand that this exception to an otherwise universal canvass was made because of fund- or interest-raising expediency. And precisely there lies a difference that deserves iteration and reiteration, emphasis and re-emphasis.

After years of observation of the medical scene and the hospitals in Duluth, we know that to the physicians of Duluth, all of the hospitals house individual patients. Some of these patients are Republicans, some are DFL, some don't care, and some might even be mugwumps—but they are all individuals and patients. No physician, so far as we can learn, has ever avoided any hospital because it contained Republicans, DFL's, negroes, whites, Jews, Christians, or whatever. Mark this difference then: the *individual* is the focus for the attention of our independent practitioner of medicine, but the politician and political machine act on the basis of the political convictions or leanings of a *group*. No need to picture for you what might result when a patient with political leanings at variance with those of the party in power would seek medical care from a politically administered system of medical practice.

Preventive medicine may work on a *group* basis: military medicine may work on a *group* basis: but the medical care of one person must be personal and *individual*ized. We say, long live the difference, and may we find forceful enough means to convince even our least sincere politicians of its profound reality.

H.G.M.

ORAL COMMUNICATION

Have you ever been surprised by a patient's explanation of what he thought you meant by your oral instructions? Undoubtedly, you knew exactly what you wanted him to do and you may have used words of one syllable. But somehow he just did not get the idea.

Who is at fault in this kind of communication failure? Is it the patient? Or is it you, the doctor? The human reaction is that it must be the patient. "How can anyone be so stupid as not to undestand me?" Unfortunately, such a diagnosis does not help us prevent future errors in communication.

The key to a good deal of our communication failure is in the phrase, "He didn't get the idea." How does one get an idea? Most of us seem to have the notion that an idea is something exact that can be communicated from one person to another in the same way water is transmitted through a pipe. As beautifully simple and desirable as this notion is, it is psychologically unsound. Words are merely symbols for things within our own experience. The idea you, the doctor, have is colored by all of your years of medical schooling and experience. The idea the patient gets is colored by his strange modern world of pseudoscientific advertising, a world in which science and magic are one. Radio and TV tell him about new "scientific" discoveries which would put any witch doctor to shame. The patient "knows" about "immediate relief from pains of arthritis and neuritis." Is it any wonder that the patient comes to you expecting some pretty high power mumbo jumbo?

Sensing the difficulty of communicating with a patient, many doctors have adopted the policy of telling the patient as little as possible. Whatever they do tell him is then phrased in such technical language that he cannot understand anyway. Unfortunately, this approach only furthers the patient's notion that medicine and magic are brothers. The patient gives up trying to understand his ailment and instead puts himself into the complete trust of the doctor just as his primitive brother used to do with the tribal medicine man.

In order to improve oral communication with the patient, the doctor must strive toward a two-way flow of communication. Merely asking the patient whether he understands your instructions is not enough. Because of pure ignorance, the patient will answer, "Yes." This tells the doctor nothing as to the degree of understanding which has taken place. A better approach is to provide the patient with a few of the facts phrased in non-technical language and then lead the patient into a discussion of his case.

Although better oral communication with the patient will demand more time from the doctor, the time spent may be a good investment. The possibility of the patient's taking better care of himself, the dispelling of the note of magic in medicine, and the development of a more sympathetic attitude toward the medical profession are only a few of the possible outcomes of better oral communication.

Francis E. Drake
Department of Rhetoric
University of Minnesota

PSYCHOSOMATIC MEDICINE

Psychosomatic medicine, in the strict sense of the word, refers to a specific group of stress disturbances manifested by autonomic nervous system or endocrine dysfunction, and apparently caused by a combination of psychological and somatic factors. Psychosomatic medicine is not synonymous with psychiatry; it does not include all illnesses with psychological and somatic factors in either causes, symptoms, results or sequelae (or it would be synonymous with the whole field of medicine); and it is not properly a definition of conditions, such as suicide, with emotional causes and somatic consequences.

The primary concern with psychological factors expressed by most investigators in psychosomatic medicine results mainly from the greater promise these factors give of developing a more effective treatment approach, and not because the somatic factors are less important. Earlier expectations that a specific personality pattern could be found for each psychosomatic illness have not materialized; current investigations suggest that patients with psychosomatic disturbances of any kind rely primarily on the mechanisms of unconscious repression and reaction formation to conceal from themselves and others residual dependent strivings and aggressive impulses. As children, they apparently failed for various reasons to satisfy the strivings or to find appropriate outlets for the impulses; at the same time they developed enough personality strength to keep these unresolved problems from obvious interference with their adjustment to the environment. Consequently, they seldom appear "neurotic," to themselves or to others, and often resist exploration of their personality problems.

However, these disturbances are for the most part progressive and disabling, and the psychological factors do not respond well unless treated early. Therefore, the physician should search for contributory psychological as well as somatic components at the time of the initial diagnosis of psychosomatic illnesses such as peptic ulcer, ulcerative colitis, essential hypertension, thyrotoxicosis, glaucoma, migraine, rheumatoid arthritis, and certain types of bronchial asthma and eczema. An early assessment of the relative significance and treatability of each factor in each individual case expedites the planning of treatment. Although absolute proof is lacking, there is strong evidence that treatment of psychological factors reduces the frequency and intensity of exacerbations, and delays the development of irreversible changes in many of these conditions.

C. Knight Aldrich, M.D.

PRESENT TREATMENT OF PULMONARY EMPHYSEMA

Despite the unknown etiology of chronic pulmonary emphysema, significant advances in therapy have been made in the past decade based on the alterations in physio-pathology in this disease. With no single specific "cure" available, the complexity of proper management requires a knowledge of cardio-respiratory physiology, clinical bacteriology, allergy, and the pharmacology of bronchodilator and corticosteroid agents. More recently, the psychotherapist and thoracic surgeon have become a part of the therapeutic "team."

Improvement in the ventilatory function of the lungs results from the use of measures designed to (1) relieve bronchospasm, (2) aid in the elimination of retained secretions, (3) control sino-bronchopulmonary infection, (4) correct hypoxia and disturbances in acid-base balance and (5) reduce the state of hyperinflation of the chest and promote diaphragmatic breathing.

The inhalation of sympathomimetic aerosols such as racemic epinephrine (Vaponefrin) or isopropyl arterenol (Isuprel) are of great value in the relaxation of bronchospasm. Deliberate coughing following aerosol inhalation frequently aids in the expectoration of retained mucus. Oral administration of aminophyllin and ephedrine may be useful in long-term management. With more severe bronchospasm, the rectal administration of aminophyllin dissolved in water has been more effective. The use of the corticosteroids and prednisone may be life-saving in the presence of intractable bronchospasm. These are especially useful when persistent, severe obstructive dyspnea follows an upper respiratory infection or exposure to a specific allergen such as pollen.

The use of saturated solutions of potassium iodide, syrup of ipecac and intermittent courses of Fowler's solution may aid the patient in his ability to expectorate viscid sputa. Lowering of the surface tension as well as humidification is obtained with detergent aerosols such as Alevaire (0.125 per cent oxyethylated tertiary octylphenol formaldehyde polymer). In the presence of tenacious purulent secretions, the use of a proteolytic enzyme aerosol such as Tryptar (crystallin trypsin) or Pancreatic Dornase (pancreatic desoxyribonuclease) has been used. There has been some disagreement as to their effectiveness and local irritation consisting of pharyngitis and glossitis has been encountered with Tryptar aerosol when inhaled for five days or more. The most useful of the mechanical methods of accomplishing bronchial drainage in co-operative patients is Exsufflation with Negative Pressure (EWNP). The high expiratory flow rate achieved with this device is often responsible for aiding in the elimination of mucopurulent plugs which the patient cannot expectorate with his natural cough. Intermittent pressure breathing devices, such as the Bennett, M.S.A., Emerson and Halliburton, while helpful in conjunction with aerosol therapy especially when the alveolar ventilation is inadequate, do not provide adequate changes in pressure gradient necessary to simulate cough.

Aerosol therapy with penicillin and/or other antibiotics is indicated in the treatment of a coexisting sinusitis, bronchitis or bronchiectasis. The long-term arrest of chronic bacterial infection plays an important role in the management of the patient with pulmonary emphysema. The broad spectrum antibiotics, administered orally for periods of six to ten days, are especially useful in acute suppurative infections of the sinuses and bronchi that frequently follow a "common cold." Prolonged use of the broad spectrum antibiotics may be hazardous since a change in bacteriologic flora with superinfection or the emergence of a resistant organism has been encountered.

The relief of hypoxia by oxygen therapy is often necessary especially during an acute exacerbation of obstructive dyspnea. The sudden administration of high concentrations of oxygen may produce hypoventilation, retention of carbon dioxide, and respiratory acidosis accompanied by disturbances in the state of consciousness, coma and death. Oxygen therapy should be begun with low concentrations provided by a 1 or 2 liter flow per minute, administered with a double-bent nasal catheter. The oxygen concentration may be raised gradually, a liter per minute each day, until a level of 6 liters per minute is reached; a gradual reduction, usually requiring five to seven days, should be employed at the termination of therapy. The treatment of respiratory acidosis requires the use of devices which increase the minute ventilation, such as the tank respirator, IPPB, or the Exsufflator with Negative Pressure in addition to steroid and bronchodilator therapy. The use of a carbonic anhydrase inhibitor (Diamox) has been of value in a few instances.

Overinflation of the lungs is reduced by manual compression of the lower ribs and upper abdomen after the inhalation of bronchodilator aerosols. Together with pursed lip-breathing during the expiratory phase of the respiratory cycle, more complete emptying of the alveoli is possible since these maneuvers tend to maintain a wider bronchial lumen and aid in the expulsion of retained secretions. The enhancement of diaphragmatic breathing by active and passive breathing exercises improves ventilatory efficiency and is, perhaps, the most valuable measure in the long-term management of patients with pulmonary emphysema. Training is facilitated by the head-down position or by placing a 10-pound weight over the lower abdomen. The patient is encouraged to inspire by diaphragmatic contraction with expiration aided by the increase in intra-abdominal pressure provided by the weight. These exercises are continued as a daily routine, and when properly learned, appreciable diaphragmatic movement occurs in the upright position. The use of an abdominal emphysema belt aids and encourages diaphragmatic breathing in the trained ambulatory patient. Pneumoperitoneum has been used infrequently and appears indicated only in a small percentage of asthenic patients in whom elevation of the diaphragm could not be achieved by exercise and a properly applied belt. The dangers of aeroembolism, infection or hemorrhage have limited its applicability to the physician with specialized training.

Hylan A. Bickerman, M.D.
Columbia University

DIVORCE AND FAMILY RELATIONSHIPS

Preparing and presenting petitions for divorce is one of the responsibilities of the Legal Aid Department of Family Service. No legal aid service is provided for any family whose income would permit the use of a private attorney. Clients come upon referral from the County Welfare Board, other social agencies, lawyers, former clients, and the citizenry in general who know of the service.

Due to the pressure of work in the attorney's office, there is a long delay between the request for a divorce petition and the drawing up of the papers. This interim period gives the caseworker who takes the application an opportunity to help both spouses try to find a way of living together which will give some satisfactions to the whole family.

Some homes have been broken long before the legal process occurs. Fathers or mothers may have left the community months or years ago. No address is known by the remaining partner nor by the paternal family or friends of the missing parent. Families could bear the physical separation if there were evidences of affection given them such as birthday cards, Christmas greetings, valentines, or a money gift now and then. But when families have experienced no evidence of love, let alone evidence of a feeling of responsibility from an absent parent, the actual obtaining of a divorce merely confirms a break already made.

Each parent bears a responsibility for making a happy home. Perhaps the marriage got off to a poor start because neither had a happy family as a pattern for future living. Perhaps the husband and wife have difficulty in making a good life because of a great difference in their own backgrounds. Sometimes the needs of one partner are so great they can scarcely be met by the other, no matter how much effort is put into the marriage. Helping families find a balance, satisfactory to them, may take a long time even though each partner tries.

Broken homes bring some problems to their members which might not have been taken into consideration when divorce was sought as a solution to other problems. Because children are usually given to the custody of the mother, she finds herself trying to be both father and mother. Her confidence has been shaken as a wife, yet, in that unenviable state of mind, she must meet emotional and maybe financial needs formerly shared by her husband, at least theoretically. Children are quick to take advantage of indecision, and the mother, unable to set limits for behavior, finds herself with less and less control of her children to their detriment. The father, too, has new problems. He may visit his family, but that is an artificial manner of association with his children, so unsatisfactory that he gradually drifts away, and becomes only the provider of a "court order" for which he gets little thanks or appreciation from his children, and only a feeling of frustration for himself.

Loneliness is hard to meet, so each may seek a new marriage. Second marriages of either partner can produce the same or different problems. There is the adjustment to the new parent, followed perhaps by adjustments to other children. There are the financial problems due to two families and loyalties to each.

While divorce is often a necessary result of long-continued unhappiness, it should be approached slowly and carefully, and only after counseling. Marriage counseling is available at Family Service for everyone who lives in the area supported by the Community Chest.

Althea Atwater
Legal Aid Consultant

Fifth in a series on Family Service of Saint Paul—a Community Chest agency.

TRAVELERS CHECKS AND LETTERS OF CREDIT

An item often neglected in planning summer vacations is the protection of travel funds. Nothing can spoil a vacation trip more completely than lost or stolen money.

Protecting your travel funds is really a simple matter. Just convert them into safe and convenient Travelers Checks at your bank. Travelers Checks can almost be called an international currency, because they're accepted everywhere and can be spent like cash anywhere with just your signature for identification. You sign them when you buy them, and countersign them when you cash them. It's the likeness of the two signatures that makes the checks cashable. For convenience, they come in denominations of $10, $20, $50 or $100, and they cost only 75 cents per $100 worth.

Travelers Letters of Credit are another bank service which protects funds. This service is of particular value to persons traveling abroad who wish to carry additional funds for emergency purposes, or for expensive purchases. It should be used to augment your Travelers Checks, not take the place of them. A Travelers Credit can be applied for at your bank. It is your bank's letter of instruction (in special form) to correspondent banks all over the world to pay you money as you request it, but not to exceed the amount stipulated in the Credit. Letters of Credit are usually not issued for amounts less than $1,000. At the time of issuance, you will be given a list of banks, and their locations, where you will be able to draw money under the credit. Payments will be made by these banks in the United States or foreign countries upon presentation of the Letter of Credit and your signature.

Because of the low cost and wide acceptance of Travelers Checks, Travelers Letters of Credit are not used as much as they once were. The main objections are the limitations on places and banks where cashable, and the fact that if the credit is lost or stolen it will cost the purchaser approximately $150 to have a stop payment placed against it. Travelers Checks, however, are safe, convenient, and can be spent anywhere at practically anytime. And if they are lost or stolen, your money will be promptly refunded at no cost. Don't spoil your vacation. Protect your travel funds by using Travelers Checks.

Kenneth F. Merrill
The First National Bank of Saint Paul

NEW FIELDS AND RESPONSIBILITIES IN TUBERCULOSIS RESEARCH

At no time in history have so many avenues of approach been open to the investigator who would learn the secrets of tuberculosis. It must be admitted that so far the acquisition of basic dependable information has been difficult and slow, but there is now great hope that new advances, many of immediate practical importance, will soon be realized if current programs are expanded. A few examples can be cited.

Although it has been known for more than fifty years that a limited but definite immunity to tuberculosis can be induced by the use of dead or attenuated tubercle bacilli, the nature and location of that immunity and the specific antigen or antigens involved have been extremely elusive. The refinements of protein chemistry, tissue culture and other laboratory techniques now seem to be leading to some understanding of the mechanisms involved and perhaps to improved vaccines and specific tests for clinical tuberculous activity.

Dr. Emil Bogen in California has demonstrated the existence of several bacteriophage strains capable of lysing tubercle bacilli. From work in progess, it now appears that lysogenic tubercle bacilli also exist. It can be predicted confidently that cultivation of this new field would unearth a wealth of new knowledge.

The successes of modern drug and surgical treatment have hinted at spectacular developments and have received wide publicity, but the public is not sufficiently aware of the shortcomings of the therapeutic tools currently available. There are many failures in treatment. In selected cases, the results are often miraculous, but in many others the fatal outcome is merely delayed and relapses are frequent. Only three effective drugs are in general use, and none is completely bactericidal. All of them are so slow in their action they must be given for months and even years. New drugs and new combinations of drugs can be discovered and developed only through research.

We have a great need for the immediate expansion of tuberculosis studies. The catalyst is money. The Public Health Service, the Veterans Administration, the tuberculosis associations and other official and voluntary agencies are doing what they can but it is not enough. Surely, this nation which prides itself on doing the difficult immediately, and the impossible if given a little time, will not accept a stalemate in the battle against a lowly, single celled, non-motile plant which continues to sicken enough citizens every year to maintain a constant total of 400,000 active cases.*

Floyd M. Feldmann, M.D.

THE NURSING TEAM

The nursing team represents an attempt to provide high quality of nursing service at a time when the number of graduate and student professional nurses cannot keep pace with demand. Although their number is greater than at any other time in our nation's history, except during the Nurse Cadet Corps period, it has become necessary to utilize other personnel able to provide supplementary service.

---

*Estimate by Public Health Service and National Tuberculosis Association.

Practical nurses, taught to contribute the more non-technical and non-judgmental aspects of nursing under the supervision of a professional nurse or physician are integrated into the nursing staff as members of the nursing team. Nurses' aids, trained on the job, are also members of the team in hospitals where they are employed. The team leader, sometimes a registered nurse and sometimes an able professional student, with her team is responsible for the care of the group of patients assigned to her by the head nurse. The leader will decide the best way to use the knowledge and skills of the individual team members to provide the highest possible quality of nursing for the team's group of patients, and she will supervise and teach the members of her team as they carry out their assigned duties.

To be effective, there are some very essential principles to be followed.

1. The entire hospital staff must be carefully oriented to the concept of team nursing and its methodology.

2. Professional nurse team-leadership must be adequate to provide indicated supervision of non-professional nurse members of the team.

3. All team members must believe in the philosophy of team work and must understand individual assignments thoroughly.

4. The team leader is administratively responsible for the patients in her group and therefore medical staff members should communicate with her in regard to their patients.

The personnel constituting a nursing team varies within the same hospital and from one hospital to another. In addition to the leader, the team may include other professional nurses—graduate and student, practical nurses—graduate and student, nurses' aids, and orderlies. On the other hand, any one or more of these may be absent.

If members of the medical staff in a hospital find nursing service being provided by nurse teams and are a bit confused by it, they will find members of the nursing staff most eager to discuss the concept with them either individually or at a medical staff meeting.

Myrtle H. Coe
School of Nursing
University of Minnesota

LOCKED TWINS, CHIN TO CHIN, OBSTRUCTING LABOR

(Continued from Page 36)

Comment

An x-ray picture of all twin pregnancies for diagnosis of fetal positions early in labor is desirable; if the first fetus presents by breech or footling, x-ray is essential.

Discussion

Dr. Roger Countryman, St. Paul, presented a report of chin-to-chin locked twins. A short very active labor brought the breech of the first baby through the introitus before unlocking of the heads was possible. Decapitation became necessary for delivery of the first twin. The second twin was delivered normally and survived.

Dr. Leonard A. Lang, Minneapolis, presented a report of chin-to-chin locked twins. When the breech of the first did not descend readily, x-ray was taken, revealing the locked chins. He was successful in pushing up the breech of the first twin, unlocking them, and then was able to deliver both twins alive.

References

1. MacDonald, Ian: Brit. M. J., 2:1214, 1912.
2. Gehse, U.: Zentralb. f. Gynak., 50:1654-1657 (June 19) 1926.
3. Hunter: J. Obst. & Gynaec. Brit. Emp., 35:231, 1928.
4. Moore, Joselyn: Brit. M. J., 2:56 (July 8) 1933.
5. Spence, J. H.: Brit. M J., 2:1222, 1937.
6. Whitfield, C. A.: J.R.A. Med. Corps., 69:401 (Dec.) 1937.
7. Peters, L.: California & West. Med., 46:403 (June) 1937.
8. Russell, J. J.: Brit. M. J., 2:1205 (Dec. 10) 1938.
9. TeGroen, C. J.: South Africa M. J., 12:181 (March 12) 1938.
10. Bowles, H. E.; J.A.M.A., 110:1551 (May 7) 1938.
11. Nicolson, E. L.: J. Obst. & Gynaec., Brit. Emp., 49:162, 1942.
12. Wright, S. W.: Lancet, 2:211 (Aug. 22) 1942.
13. Bradlow, B. A.: Brit. M. J., 2:532 (Oct. 21) 1944.
14. Love, Mary: Brit. M. J., 2:12 (July 1) 1944.
15. Grieg, D. S.: Brit. M. J., 1:13 (Jan. 5) 1946.
16. Lawrence, R. F.: J. Obst. & Gynaec. Brit Emp., 56:58 (Feb.) 1949.
17. Geggie, J. H. S.: Canad. M. A. J., 57:381 (Oct.) 1947.
18. Kimball, A. P., and Rand, P. R.: Am. J. Obst. & Gynec., 59:1167 (May) 1950.
19. Stenstrom, Gengt: Acta Obst. & Gynec. Scandinav., 31:1-8, 1951.
20. Lattuada, Henry P.: Am. J. Surg., 81:448 (April) 1951.
21. McIntyre, I. D., and Barr, G. M.: Brit. M. J., 1:1123 (May 19) 1951.
22. Friedman, Daniel D.: New York State J. Med., 53:995 (April) 1953.
23. Titus, Paul: Management of Obstetric Difficulties, 4th ed., p. 398, 1950.
24. Beck, Alfred C.: Obstetrical Practice. 4th ed., p. 466, 1950.
25. DeLee, J. B., and Greenhill, J. P.: Principles and Practice of Obstetrics. 9th ed., p. 425, 1949.

R. H. WILSON, M.D.

President, Minnesota State Medical Association

President's Letter

To Members of the Minnesota State Medical Association:

This is my first message to you as President of your Association, and I want to take this opportunity, first, to wish you all a very happy and prosperous New Year. I want to take this opportunity, also, to express my deep appreciation of the honor you have conferred on me. I hope I may prove worthy of it.

I would also like to be the worthy representative, especially, of that great group of men who practice good medicine outside the big cities of the state, some of them hundreds of miles from the great centers of teaching and research. These are the men who man the battle stations of medicine, and I hope that I can say, when January rolls around again next year, that I have helped a little to protect their freedom as doctors and to keep their standards high.

To do so, I shall certainly need the help of the Council and officers of the State Association for their invaluable wisdom and experience. I shall also need the help of county medical society officials all over the state. They are busy men, I know, and they have little time for anything outside their own programs and problems. But I am going to count heavily on them, too, because the success or failure of our work as an organization depends largely on how well we meet their needs.

It is certainly true that times are good as we begin this year of 1956. Furthermore, our patients have confidence in us, as many recent surveys have shown. But the millenium in medicine has not arrived, for all that.

There are still threats of regimentation on the horizon, though they are taking on new forms. Welfare costs are rising, and physicians unfairly get the brunt of the blame for that. Some Minnesota towns are still without doctors, and more doctors and hospitals are needed in many areas of the state. These seem to be perennial problems. There are others, and our state organization must be geared to meet them all.

As chairman of a committee which has dealt for many years with welfare and relief, I have seen how the close and conscientious co-operation of medical organization with the official agencies can operate to solve many of the major welfare problems in this state. I am confident that the same kind of co-operation in other fields will go a long way toward keeping medicine free and standards of practice high in Minnesota.

I follow a long line of distinguished and dedicated men who have devoted themselves to that end. I cannot do better than to follow in the spirit in which they have led.

R. H. Wilson

President, Minnesota State Medical Association

Medical Economics

Edited by the
Committee on Medical Economics,
Minnesota State Medical Association
George Earl, M.D., Chairman

SOCIAL SECURITY—BIG ISSUE IN 1956

Every physician who is conscious of his duties as a citizen should now be taking an active interest in a timely issue which the American Medical Association considers of great importance—not only to the medical profession but to all of the American people.

That issue is HR 7225, a bill passed by the United States House of Representatives last summer near the end of the Congressional session. This bill, known as the Social Security Amendments of 1955, was first rushed through the House Ways and Means Committee without public hearings. Then it was passed in the House, by a vote of 372 to 31, under a suspension of the rules which barred amendments and limited debate to forty minutes. The Senate Finance Committee, however, refused to take hasty action on a bill of such major importance. After hearing the many serious questions raised by Mrs. Hobby, then Secretary of the Department of Health, Education and Welfare, the Committee decided to hold extensive public hearings during the second session of the 84th Congress.

Just what is this legislation that appears to be so politically attractive to individuals with an eye on the 1956 elections? Why was the House majority leadership so determined to avoid open hearings and normal debate? Let's take a brief look at the main provisions of the bill.

This is the legislation which would lower the Social Security retirement age for women from sixty-five to sixty-two; extend monthly benefits for permanently and totally disabled children beyond the age of eighteen; expand compulsory social security coverage to all self-employed professional groups except physicians, and raise social security taxes over and above the increases already scheduled for the next twenty years. Those provisions alone demand careful study of their effects on the philosophy, scope and financial stability of our social security system.

Serious Implications in Bill

The most controversial section of the bill, however, is the one which would make permanently and totally disabled persons eligible to receive their social security retirement benefits at age fifty instead of sixty-five. It is this section which is of particular concern to the medical professsion. It is of far greater concern than the question of voluntary or compulsory coverage of physicians under the Social Security system. That is a separate issue which we are not discussing in this editorial. The plan for a national system of permanent and total disability benefits has far more serious implications for medicine and the nation.

It raises questions such as these: Is there any real need for a federal program? What are the facts on permanent and total disability? Won't this duplicate or overlap existing programs of assistance and rehabilitation? What effect will cash handouts have on a patient's incentive to be rehabilitated? Won't this extend federal control over physicians? —and, finally—How will this affect the future of medical practice? Will this lead, step by step, to the lowering and eventual elimination of the age-fifty eligibility requirement; then, cash benefits for the dependents of those who are permanently and totally disabled; then, a temporary disability benefits program; then, cash benefits or direct government payments for hospital or medical costs, and then, ultimately, a full-fledged system of government health insurance?

These are but a few of the many grave questions which already have been raised concerning this legislation. As physicians, we must be concerned over the medical aspects of the problem. As citizens, we also must be concerned over the trends and implications in the never-ending expansion of our social security system. The minority report of the House Ways and Means Committee expressed it this way:

> "We do not believe that our committee has discharged its obligation to either the Congress or to the American people by its brief and closed-door consideration of this vital legislation. We have sought to point out the grave social and economic implications of the bill. We have dwelt at some length with the staggering ultimate costs of this developing program, because we do not believe that either the Congress or the public has any conception of its magnitude."

Our social security system now has reached the point where any further changes may have a profound influence on the nation's economic, social and political future. The time has come to face up to the question of just what social security should accomplish and just where it should stop. The Association strongly *urges* that the social security issue be taken out of the arena of vote-catching politics; that there be an objective, thorough study of social security in all its present and future aspects, and that the facts and realities emerging from such a study be used as the basis for a sound national decision on this vital issue. It especially protests precipitate action on the complex question of disability without thorough investigation of alternative mechanisms.

In our opinion, that is a reasonable, responsible policy that deserves the moral and intellectual support of every physician.

NORTH CENTRAL MEDICAL CONFERENCE MEETS IN SAINT PAUL

The North Central Medical Conference had its usual vigorous, well-attended meeting this year on November 20 in Saint Paul. Lay-sponsored Medical Plans and the Relationship Between Physicians and Hospitals were reported on and discussed.

Medicine has been progressing in giant steps during the past few years. The health of the citizens of this country has never been so good or received such wise and competent care. Yet doctors, as guardians of the public health, must be more alert than ever to protect the quality of this care. Panaceas that offer solutions to health problems are often deceptive. One of the most important functions of the North Central Medical Conference was to raise pertinent questions about some of the current cure-all plans.

Doctor Earl Notes Current Trends

Dr. George Earl keynoted the meeting with his presidential address, a general discussion of trends in health care today.

Some of the most important of these trends are:

1. More individual voluntary prepayment health insurance and/or services.
2. More group arrangements for such services.
3. More unions or co-operatives handling health problems.
4. More provisions for large veterans' installations and medical care, and for tax-supported hospitals of all types.
5. More public health nursing services and activities.
6. More lay-controlled groups, outside of unions and co-operatives, sponsoring health care plans and services.
7. More political activities and interest, with increasing legislative enactment in the health field.
8. A general increase in the public's health consciousness and what can be done to make the nation's health better.

Must Take Stand on Legislation

Dr. Earl said:

> "Politics have become bound up with matters of health care and medicine has found itself in a position where it must make political decisions. When our lawmakers move toward legislation affecting medicine, we as a profession must consider it carefully in the light of all previous experience, and take a definite stand on its merits."

Lay-sponsored Medical Plans

E. L. Bernhart, M.D., president of the State Medical Society of Wisconsin; J. E. Kelsey, M.D., Des Moines, Iowa; and A. O. Swenson, M.D., president of the Minnesota State Medical Association, spoke on lay-sponsored medical plans.

Dr. Bernhart favored expansion of Blue Shield and other prepayment plans to greater numbers of people. But the cost of these programs must be kept within the budget of industry and within the reach of the individual members, he said.

> "More than 150 million people can be enrolled under the voluntary system of health insurance if we have the whole-hearted support of the medical profession," he said, "and only with this attitude will we avoid the destruction of the private practice of medicine. Only with this attitude will we preserve the gains we have made. The legislative hoppers of states and the United States contain many dormant proposals which, in the light of today's economy, would put Wagner, Murray, and Dingell to shame as social planners . . ."

Dr. Bernhart added:

> "Industry pays the bill for prepaid medical insurance. Labor seeks to extend the benefits of prepayment. The medical profession can and will render those services to the mutual advantage of all and will continue to do so on a voluntary basis when they look the facts in the face."

Doctor Kelsey Talks on Kaiser Foundation

There are more than 525 physicians participating in the health plan of the Kaiser Foundation and facilities, including eleven hospitals and many clinics with a total bed capacity of about 2,000. To call this a medical empire is no exaggeration.

According to Dr. Kelsey, the plan is successful; it is popular; and many of the facilities are outstanding. The cost to the patient is roughly equivalent to that of other voluntary insurance plans in California. Why, then, is there opposition to the plan in the medical profession?

Organized medicine's opposition has been to the "closed panel" aspect of the group. To counteract such plans, Dr. Kelsey recommends, ". . . the establishment of a method of comprehensive coverage for disease, which is prepaid, which can be offered to all income groups, comprehensive in scope, and which permits a free patient-doctor relationship and a free exchange of ideas between all physicians. Kaiser and other closed panel plans will continue to grow until this challenge is met."

Union Medical Care Plans Expanding

Dr. A. O. Swenson described the history of union medical care plans which gained impetus during World War II when wage increases were practically halted. Health and welfare plans became of prime importance in union-management negotiations.

Those advocating co-operative systems of medical care are insistent on lay control, comprehensive care and preventive medicine associated with group practice. The insurance principle is ignored.

Dr. Swenson suggested that a definite set of policies be developed for medicine to follow in consultation about these plans. Medical care problems relating to sanitation, safety and preventive medicine in industrial plants should be paid for by management. Medicine should take the leadership in the area of fringe benefits concerning health and in developing medical care plans that are adequate for both preventive and curative medicine. The development of lay-sponsored clinics has not been satisfactory due to the lack of personalized service, loss of efficiency and the removal of competitive influence.

Physician-Hospital Relationships

F. C. Coleman, M.D., Des Moines, Iowa; A. J. Offerman, M.D., Omaha, Nebraska; and D. H. Breit, M.D., Sioux Falls, S. D., covered the drastic change in physician-hospital relationships in the past quarter century. The hospital originally was built and operated by the doctor to care for his ill patients more effectively. Now the function of the hospitals has expanded to include many more services and lay personnel has taken over the responsibilities of administration.

Among the reasons for this shift is the fact that there are many more diagnostic procedures, some utilizing radiology and pathology, and the most convenient place for this equipment is the hospital. Gradually, radiologists and pathologists have "set up practice" in hospitals, sometimes being paid directly by the hospital. This has led to the adoption, among some hospital administrators, of the premise that the next step is for the hospitals to employ physicians generally as salaried personnel. The implications are serious.

Dr. Coleman discussed a lawsuit of the Iowa Hospital Association and thirty-four member hospitals against the Attorney General, the Iowa State Board of Medical Examiners, and the Iowa Association of Pathologists. Since the Conference, this suit has been settled against the plaintiff. It was the conclusion of the Court that work done by the pathologist and radiologist constitutes the practice of medicine. Hospitals should not sell the services of these specialists. This decision will have an important influence on hospital-physician relationships.

Good relations exist between hospitals and medical groups in Nebraska. The foundation of this satisfactory relationship, according to Dr. A. J. Offerman, was the exclusion of benefits for medical services in the Blue Cross contract.

In his discussion, Dr. Breit emphasized that a sharp distinction should be maintained between hospital and medical services. Medical services should be under the unhampered direction of physicians and the energies of hospital administrations and personnel could be directed toward the original purpose of caring for the sick.

At this moment, it is exceedingly important that the decrease in the number of new cases of clinical tuberculosis evolving and the precipitous decline in mortality are not interpreted as the approach of immediate ultimate victory over tuberculosis. Such an interpretation could play into the hands of the tubercle bacillus, which could soon again become as widespread and destructive as it was in this country fifty years ago. The phenomenal success in reducing morbidity and mortality represents a battle less than half won against the tubercle bacillus.—Editorial, J. Arthur Myers, M.D., *Journal-Lancet,* April, 1955.

The Dean's Page

WANTED: MORE APPLICANTS FOR MEDICAL SCHOOL

Surprisingly, for most physicians, every medical school in the United States might well hang out such a sign on its front door . This does not mean that medical schools do not have sufficient number of applicants to fill their classes. It does mean that the number of well-qualified applicants has dropped to a point that Admissions Committees have become deeply concerned about the quality of the last ten or twenty students accepted.

The peak of applications for admission to the medical schools of this country was in 1949-50 when 24,434 individuals applied for 7,042 places in freshman medical school classes. Last year, the number of applicants had dropped to 14,538 individuals for 7,449 places.

The University of Minnesota had 298 applicants worthy of serious consideration for 126 places; while the University of Wisconsin had 167 applicants for 82 places; Iowa, 144 applicants for 120 places; and Michigan, 512 applicants for 204 places.

The competence of the medical profession depends more upon the quality, that is, upon the ability and the character of the medical students, than upon any other single factor. It is essential, therefore, not only that medical schools be able to fill their classes with acceptable applicants, but that they be able to select students of superior qualifications.

This leads to the question as to why, in view of the splendid opportunities in medicine, there are not more young men and women applying for admission to medical schools. The answer certainly is a complex one; but two major factors are that most young men and young women do not really understand the splendid opportunities available to them in the profession of medicine, and there is a very widespread impression that it is practically impossible to gain admission to a medical school.

A high school principal in an out-state community of Minnesota recently told me that in his eight years of service in that position, not a single student had entered premedical courses, while several able young men each year entered colleges of engineering. The engineering societies of the state, he said, send a representative to his high school each year to talk to and counsel with students about opportunities in engineering, but never has anyone come to speak about careers in medicine. In fact, it was his impression that medical schools are so flooded with applications that they are not interested in receiving any more.

This being true, I would urge physicians of the state to encourage young men and women of ability and character to consider the great opportunities and satisfactions which a career in medicine can afford them. And, supplementing individual efforts, I would urge county medical societies to arrange to have representatives of the medical profession carry this message into the high schools of the state as is currently being done by engineering and other groups.

—Harold S. Diehl, *Dean*
University of Minnesota Medical School

History of Medicine in Minnesota

THE MEDICAL HISTORY OF RICE COUNTY

(1855-1901)

ADOLPH M. HANSON, M.D.
Faribault, Minnesota

"It was natural that the lamp should be a frail earthen thing in comparison to the light within, for it had not created it and only held it for a short moment."—*Pilgrim's Inn* (by Elizabeth Goudge).

This short medical history of Rice County in the State of Minnesota dates from the summer of the year 1855, when **Nathan Marvin Bemis, M.D.,** established his practice at Faribault, to and including the year 1901.

The following biographical sketch was published in the local weekly newspaper immediately following his decease:

"Nathan Marvin Bemis, M.D., the first physician to settle permanently in Faribault, was born in Whitingham, Windham County, Vermont, March 25, 1821, his ancestors being English, his father a farmer, with whom he remained until eighteen years of age. He afterwards studied medicine with Dr. Horace Smith of Wilmington, and finally attended the Vermont Medical College at Woodstock. After his graduation he practiced medicine three years in Shutesbury, Mass., and nine or ten years at Cummington, the same state. In May, 1855, he came to Faribault. Then there was but one frame house in the place, which belonged to Alexander Faribault. The Sioux were still here, and the Doctor was called upon for medical services by two of their chiefs, Papa and Red Legs. His professional rides covered a large extent of territory, and probably few physicians of the state have ridden over more miles of our country roads than he. In early life he was an abolitionist, and voted for James G. Birney. After the Republican party was formed he allied himself with that organization. Among Free Masons he was a Knight Templar, and was one of the oldest, if not the oldest Mason in the city. He has twice been Master of the Faribault Blue Lodge and Noble Grand of the Odd Fellows three times. Dr. Bemis was married February 10, 1842, his wife being Miss Emeline H. Adams, of Heath, Mass., who survives him. They have had five children, all of whom are living save one son, George O., who died when but three years of age. The four living children are Dr. J. G. Bemis, of Chicago, Ill; Mrs. W. G. Kerr, of Englewood Heights, Ill.; Mrs. H. C. Prescott and Mrs. D. N. Graves, of Faribault."

Dr. Nathan Marvin Bemis died on the 29th day of January in the year 1891. He practiced elsewhere for twelve to thirteen years and in Faribault for thirty-six years—a total of forty-eight or forty-nine years. His age at death was seventy years, nine months, and four days.

The same newspaper announcement of his death states further:

"Perhaps no resident of the county has been more widely known than Dr. Bemis. The first physician that settled in Faribault, for thirty-six years he has pursued his arduous calling, ministering to the demands of afflicted humanity of all classes with a faithfulness and devotion to duty which have commanded the respect and admiration of all who were familiar with his professional career. Only the pioneers can fully appreciate the sacrifices and personal endurance required of a physician at the early day when the Doctor commenced practice in Rice county—the response to calls at all hours of the day and night, involving the traversing of miserable apologies for roads, the crossing of dangerous sloughs, the fording of swollen streams, the braving of wintry blizzards, with the mercury far below the freezing point, while the drifting snow shrouded from sight the few landmarks by which the traveller might shape his course.

> "The Doctor was esteemed not alone for his talents as a physician, but for his many virtues as a citizen. He was a man of active intellect, and well informed in all the affairs that challenge public attention. Tho his name was often suggested in connection with public office, for which his talent and standing qualified him, he invariably declined to leave the ranks of private life. His nature was genial and kindly, and his disposition to co-operate with his fellowmen in active benevolence was manifested in his society attachments, he having been a charter member of both the Masons and the Odd Fellows organizations. At the time he joined the former there was no branch of the order in the country, and he went to St. Paul for initiation. He was also a charter member of the Knights Templars."

Dr. Nathan Marvin Bemis is the grand old pioneer of medicine in Rice county. He had that reverence for human life that made him "the lover of life (who) sees the flame in our dust and a gift in our breath." To help prolong it for others was his lifelong devotion.

Nature's nobleman, he is the grand old man of the medical profession here in Rice county. He represents that high ideal which prompts so many of our best youth to choose the healing art as life's vocation. He undoubtedly was responsible for the rather high standard of medical ethics in which the welfare of the patient was the prime consideration, and of which the medical profession in this county may rightly be proud. Despite personal differences, or even personal animosities, professional jealousies, et cetera, the Rice County Medical Society has always presented a solid front on all fundamental moral issues and has stood as one man in regard to good medical ethics. This has been so since the days of Bemis, Rose and Wood.

When Dr. Bemis arrived to establish his practice at the little White settlement in the Indian village of the Wau-pa-ku-ta Dakotas (Sioux) in May, 1855, his brother, Dr. Lewis Bemis, who came to Faribault about the 1st of March in the same year, departed for St. Paul. St. Paul, the largest white settlement in Minnesota in that year of 1855, was then a town of only 7,000 inhabitants.

Dr. Nathan Marvin Bemis, some months earlier, had debarked from a Mississippi steamboat at Hastings. He did not take the overland stage-route of 70 miles from Hastings to Faribault. He went on by a smaller steamboat to St. Paul where he had originally planned to settle down. There he heard of the little white and Indian village on the peninsula formed by the confluence of the Owatonna (Straight) River with the larger Cannon River. So, out of curiosity, the thirty-four-year-old physician took the trails leading south to look it over.

The last stage of his journey was made on the old winding road, east of the present highways, from the present site of Northfield to Faribault.

He had already fallen in love with the Upper *Mechi-sibi* (Indian: *mechi,* great; *sibi,* river), its plains, gently rolling hills and valleys, huge stands of timber, and countless lakes and streams teeming with fish. He saw what is now southeastern Minnesota as Mother Nature made it. It was then even more of a second Garden of Eden than it now is. What was more, the still young and vigorous pioneer physician fell ardently in love with the site of the village of the Wau-pa-ku-ta Dakota Indians, a tribe of the Sioux nation, the "Iroquois of the West," and decided to make it the home of self and family. And at Faribault he was to remain and to die in a bed in his own house, one of the oldest in the town of 1891, loved, respected, and mourned by people throughout Rice and adjacent counties.

As remembered by Mrs. Ina Smith, his granddaughter, still living here in Faribault, Dr. Nathan Marvin Bemis, several years before his death in 1891, had an impressive personality. Of average height and weight a little over 200 pounds, he was baldheaded on the crown, his white side-and-back locks came to his shoulders, and his enormous white beard was the talk of all who knew him. In his last years he was afflicted with a heart ailment. Because of this, and because he continued in practice despite his own affliction, his good wife would not allow him to go out alone on his professional calls. Either she, or the doctor's hired man (a young newcomer-lad by the name of Nils N. Ronning, who came to his house as a boy of seventeen), drove his horse and/or horses for him, depending upon whether town or country call. In order to have ample room for himself and his wife, a cozy body (who also weighed over 200 lbs.), and leave ample space between them for his professional bags and case of assorted drugs, his buggies were custom-built with a very wide seat. For most of his years in practice he drove a sulky drawn by a fast trotter when making his calls in town and on near-by country visits in nice summer-weather.

Mr. Nils N. Ronning, still living at age eighty-three (graduated from Faribault High School and the University of Minnesota to become a well-known editor, the author of many books, biographies, short histories, et cetera), has the following to say of Dr. Bemis, soon after he became his hired man, as the high school lad, for his board, room, and laundry, in his book entitled *Fifty Years in America:*

> "In the fall I went back to Faribault where my brother lived and had one of his congregations. I was to attend the public school and at the same time earn my room and board at the home of Dr. Bemis by taking care of his horses.
>
> "To my surprise I was given a place at the table with the family. I had expected that I was to take my meals in the kitchen.
>
> "As my English vocabulary was very limited, Dr. Bemis had some difficulty in making me understand that when he rapped at the door and said, Nils, Tom, it meant that I was to harness Tom. If there ever was a beautiful, gentle, intelligent horse, Tom was that horse. He could run very fast and he always wanted to run. Sometimes I went with the doctor out into the country. Then Tom would be given free reins. 'Have you horses in Norway that can run as fast as Tom?' the doctor would ask me. 'No, sir,' was my answer.
>
> "One day Dr. Bemis asked me to bring him something. As the weather was cold I thought he wanted the blanket. When I brought him the blanket, he tore it out of my hand, ran to the stable and brought back a whip. He cried, 'Whip, whip, whip.' Even now I know the difference between a blanket and a whip.
>
> "The doctor must have seen me standing in front of the posters announcing a circus, for he took me with him to the circus. He was an old man with white hair and a long white beard. He was a dignified man, but that day he threw dignity to the winds. We drank pink lemonade and ate peanuts; we looked at the animals, and he told me their names. If I got a 'kick' out of looking at the performances—and I did—he got a 'kick' out of watching me. When we came home, Mrs. Bemis asked me to tell her what I had seen. When words failed me, I used my hands and feet. I think I gave her a very good idea of how the clowns had acted."

This word-picture that Nils N. Ronning paints of Dr. Nathan Marvin Bemis and his good wife in their advanced years is one of two intelligent, understanding, friendly and fun-loving persons, who must have been generally loved as well as respected. With a deep understanding of human nature, in love with humanity and life, we could paint no truer picture of the ideal family doctor and the doctor's good wife.

This biographic sketch of Dr. Nathan Marvin Bemis, as the grand old man of the medical profession here in Rice county, is written in some detail as a word-picture of the medical man devoted to the art as his special calling. It is one of the medical doctor, who comes to a community, settles down to establish his practice and his home amongst the people he makes his neighbors for the remainder of his days. He was everybody's friend, willing to serve anyone who required and called for his services, whether able and/or willing to pay for them or not. And he did so to the last. He was a man who chose to wear himself out in the service of his fellow-beings in his special field of lifesaving rather than apply himself to less arduous tasks bringing higher remunerations in money.* The coldest science becomes tinged with compassion in direct personal contact with human suffering, has one but a little reverence for life—that vital principle of conscious organic life, which is the eternal mystery and marvel to the thinking mind.

In the "Official Register of Physicians, Minnesota, 1883-1890" the following licensed medical doctors practicing in Rice county in the course of those years are listed:

Name	*School*	*When Licensed*
Bemis, N. M.	Vermont Medical College, 1842	Feb. 25, 1887
Brubaker, Evans E.[1]	Starling Medical College, Ohio, 1878	Jan. 28, 1884
Coe, Samuel B.	Western Reserve, 1886	May 4, 1886
Cool, Daniel M.	Rush Medical College, 1862	Nov. 16, 1883
Coon, Hiram L.[1]	Rush Medical College, 1855	Oct. 11, 1883
Denninger, P. J.	H. Medical College, Chicago, 1887	Apr. 22, 1884
Dight, Charles Fremont	University of Michigan, 1879	Oct. 4, 1889
Gadbois, Wilfred	University of Victoria, 1887	May 11, 1887
Gibson, W. C.[2]	License by Examination	Dec. 10, 1886
Goulet, R.	University of Victoria, 1883	Mar. 21, 1885
Greaves, William[1]	University of Michigan, 1870	Oct. 11, 1883
Hunt, Wm. A.[1]	University of Michigan, 1882	Dec. 31, 1883
Jackson, R. H.	Long Island College Hospital, 1880	Nov. 16, 1883
Knight, Geo. H.	University of New York City, 1881	Oct. 13, 1883
Lynde, C. V.	Hahneman Medical College, 1883	Dec. 23, 1886
Nelson, Louis F.	University of Maryland, 1849	Nov. 12, 1883
Phillip, J. R.[3]	University of Victoria, 1884	Nov. 10, 1884
Pringle, A. F.[1]	McGill University, 1880	Mar. 10, 1885
Rockwell, C. B.	Homeopathic Medical College, 1883	Dec. 31, 1883
Rose, F. M.	Starling Medical College, 1861	Oct. 13, 1883
Seeley, J. S.	University of Michigan, 1876	Apr. 15, 1884
Wagner, C. H.	Homeopathic Hospital College, 1873	Nov. 26, 1883
Wood, George W.	McGill University, 1863	Oct. 13. 1883

---

1. Northfield
2. Morristown
3. Dundas

Faribault not specified

The first Rice County Medical Society was organized on February 27, 1867. The officers were: Dr. N. M. Bemis, President; Dr. F. H. Atkins, Secretary; Dr. H. N. Dale, Treasurer.

The other members were: John L. Scofield, Northfield; E. Lathrop, Northfield; J. W. Daniels, Faribault; Edward Everett, Faribault.

The society was reorganized on February 11, 1885, with the following officers: H. L. Coon, President; G. W. Wood, First Vice President; C. M. Cool, Second Vice President; W. A. Hunt, Secretary; R. N. Jackson, Treasurer.

In January of the year 1886, the name of the society was changed to "Cannon Valley Medical Society," because it admitted medical men in adjoining counties to membership.

---

*Nathan Marvin Bemis, M.D., attended Cole Younger and his companions at the Rice County Jail, Faribault, after their capture. He met them near Millersburg before the Northfield robbery. He recognized them at once upon his arrival at the jail to attend the wounded Cole Younger.

The Sisters at Bethlehem Academy presented him with a ring in appreciation of his attendance on them and their pupils in illness.

Biographies

Bemis, Nathan Marvin.—His professional life's story has already been told. It is, however, interesting to mark that, though he established his permanent residence and practice in Faribault in the year 1855, he did not take the time and trouble to secure his medical license until February 25, 1887. This was nearly thirty-two years later.

(Because John L. Scofield filled the place of the highly respected, grand old pioneer medical doctor in Northfield, as did his contemporary professional brother, Nathan Marvin Bemis, in Faribault, the writer deemed him worthy of mention immediately following Dr. Bemis, even though his surname does not follow in alphabetical order.)

Scofield, John Lozier.—Born in Stamford, Connecticut, on July 23, 1811. His parents, residents of New York City, were visiting friends at Stamford at the time. He graduated from the Medical School of the University of Pennsylvania (the oldest medical school in the United States having its charter from the University of Edinburgh, Scotland) in 1832. He started practice in New York City. Subsequently, he went to Jacksonville, Florida, where he remained only for a short time. From there he went to Raymond, Racine County, Wisconsin. On July 24, he married Miss Betty A. Dibble. With the exception of the two years (1849-1850) spent in California, he remained at Raymond until the year 1856, when he removed to Northfield, Rice County, Minnesota. He was Northfield's *first* and, for many years, *only* physician. Upon his arrival at Northfield, he immediately made a claim to land about four miles south of the village. He did not establish his residence at Northfield before March, 1858. Then he remained in Northfield until his death, except in 1862 to 1863 when he was assistant surgeon in the 4th Minnesota Regiment. Dr. Scofield was a member of the Legislature (1857-58). He also filled local public offices. He was Dr. Bemis' senior by ten years, and remained in Northfield to a ripe old age.

Beckwith, Edmond.—Came to Faribault in 1878, succeeding Dr. Nichols at the "Deaf and Dumb and Blind Institute." He supposedly moved to California before 1883. He died in 1915 at the age of seventy-nine.

Brubaker, Evans Edward.—He practiced in Northfield approximately between 1890 and 1909. He was born January 1, 1852, in Ohio, the son of Henry and Bea Brubaker, who originally came from Pennsylvania. Dr. Brubaker graduated from Sterling Medical College, Ohio, in 1878 and was licensed in Minnesota January 28, 1884. He and his wife, Caroline, came to Northfield soon after their marriage in Ohio. They had four sons: Delmar of Washington; Ernest of Albany, N. Y.; Howard taught in Kansas; and Walter of Milwaukee; and one daughter, Mrs. Bertha Masolf of Houston, Texas. All attended Carleton College. Dr. Brubaker died January 5, 1910, at the age of fifty-eight from carcinoma of the liver. He was buried at Northfield. Mrs. Brubaker later moved to St. Anthony Park, St. Paul, where she continued to live for many years.

Coater.—A Dr. Coater came to Rice County on May 19, 1880. No physician by that name was licensed in Minnesota and nothing more is known about him.

Coe, Samuel Buel.—Came to Minnesota in 1861 settling in Morristown. He was born in Randolph, Ohio, on August 1, 1835, and was educated at Oberlin College. His medical training he received at Rush Medical College. During the Civil War he served as assistant surgeon in the Minnesota Heavy Artillery. In

1877 he was representative in the state legislature. He may have received a degree from Western Reserve University in the 1880's. His Minnesota license certificate is dated May 4, 1886. A Morristown news item of February 9, 1887, reads: "Dr. Coe goes to Waterville Friday to assist Dr. Case in a delicate and hazardous surgical operation," indicating that he had a good medical training and that his services were in great demand. He apparently also lived and practiced in Faribault. In the 90's he practiced for many years at Fitzgerald, Georgia (he was licensed in Georgia in 1896). Later he practiced in Minneapolis. He died at his home in Rochester, Minnesota, on May 29, 1910, at the age of seventy-five.

Dr. Coe's American ancestry goes back to Robert Coe who arrived at Pilgrim Rock in 1634. His son, Dr. Henry Waldo Coe, was born in 1857. He started his education at the University of Michigan and commenced his medical studies under his father's supervision. He graduated from the Long Island College Hospital in 1880 and began practice in Mandan, then a village in Dakota Territory. He was the first physician to settle in North Dakota, west of the Mississippi. He became an important figure in medical and civic organizations. In 1891 he moved to Oregon and later specialized in nervous and mental diseases, owning and operating the Morningside Hospital. He gave outstanding services to the insane in Alaska for over twenty years. Famous is his friendship with Theodore Roosevelt which lasted until the latter's death. Dr. Coe was responsible for the bronze statues of "Roosevelt the Rough Rider" at Portland, Oregon, and Minot, North Dakota.*

Cool, Daniel M.—Practiced in Faribault from about 1890 to 1905. He graduated from Rush Medical College, Chicago, in 1861 or 1862. During the Civil War he served as surgeon in the Third Iowa Volunteer Infantry. He was licensed in Illinois in 1877, and for several years held the position of professor of diseases of children at the Chicago Medical College. In Minnesota he was licensed on November 16, 1883. For nine years he was health commissioner and for many years city physician of Faribault. He was a member of the Rice County Medical Society, the Minnesota State Medical Society and the American Medical Association. Dr. Cool died at the age of eighty-two at his home in Faribault on December 14, 1905, from heart disease after a long period of invalidism.

A **Dr. Cooley** "of Faribault" is mentioned in a St. Cloud newspaper of December 2, 1875. It mentioned that he formerly practiced in St. Cloud and that he received an offer to take charge of the St. Louis City Hospital and planned to accept it.

Coon, Hiram L.—Licensed to practice in Minnesota on October 11, 1883. In the "History of Rice County," published in the year 1882, is the following biography:

> "Hiram L. Coon, M.D., was born in Grafton, New York, on the 25th of August, 1828, and reared to agricultural pursuits. He removed with his parents to Milton, Rock County, Wisconsin, when twelve years of age, received an education at the common schools, Milton Academy, and Rush Medical College in Chicago, from which he graduated in 1854. He commenced the practice of his profession in Rutland, Dane County, Wisconsin, where he was married in 1855, to Miss Sarah Morton, daughter of Roger Morton. In 1856, he removed to Austin, this State, and in 1861 to Northfield, where he has been in constant practice since, giving special attention to surgery. He is a member of the State and also of the American Medical Societies."

---

*See "Sketches of Pioneer Physicians of Dakota County" (Dr. Henry Waldo Coe) *Journal-Lancet,* June 1, 1931, and Dr. J. Grassick *North Dakota Medicine, Sketches and Abstracts,* North Dakota Medical Association, 1926.

Cooper, J. B.—A doctor by this name "of Northfield" is mentioned in a St. Cloud newspaper item, dated April 21, 1881. It tells of his arrival in St. Cloud for the purpose of locating there. He supposedly had thorough professional experience and was a homeopath, having graduated from the Homeopathic College at St. Louis and a Hahnemann institution. He did not stay very long in St. Clould as a newspaper of August 11 of the same year tells of his leaving St. Cloud "a few weeks ago" and his association with a physician in Little Falls. Nothing could be discovered that would shed further light on his stay in Rice County.

Cummings, D. J.—Graduate of the Chicago Medical College. He came to Farmington, Dakota County, in the 50's and his card appeared in the *Dakota Weekly Journal* in June of 1856. He reported a case of leprosy which caused great excitement in Farmington. He practiced but a short time in Northfield, and returned to Farmington in 1877.

Dale, Harvey (or **Henry**) **Newton.**—Was in Rice County over half a century. Dr. Dale was born in Butler County, Ohio, August 2, 1831. He graduated from the Eclectic Medical Institute, Cincinnati, Ohio, in 1856, and settled in Rice County in the same year. As early as 1867 he resided in Faribault. He must have gone back to school as he graduated from Bennett Medical College, Chicago, in 1876. Dr. Dale died June 13, 1909, at his home in Faribault.

Daniels, Jared Waldo.—A prominent man in the medical history of Minnesota and about whom short biographies have appeared in the medical history of several counties. He was a colorful figure, well-known for his courage during the Indian Uprising. He practiced in Faribault from the fall of 1865 when he was mustered out as surgeon in the Civil War for over two years and settled there again in 1887. It is questionable whether he engaged in the private practice of medicine at this second period in Faribault. In 1900 he moved to California.

The following biography was copied from an apparently unpublished typewritten manuscript in the possession of the Historical Committee of the Minnesota State Medical Association entitled "The Biographies of St. Peter Physicians: Includes only such as came prior to 1873 and were prominently identified with the profession and the city."

"*Jared Waldo Daniels,* M.D., was born at Stratford, New Hampshire, June, 1827. His grandfather was one of the earliest and most prominent settlers of the town, and had served four years in our army in the war for American independence. The doctor received his preparatory education at the public schools and at the Lancaster Academy and was for some years a teacher. He pursued his medical studies with his uncle, Dr. Hatch, at Boston and after attending three courses of medical lectures graduated M.D. from the Bellevue Medical College, New York City.

"In March, 1855 he came to Minnesota and was appointed physician to the Upper Sioux Indians at Yellow Medicine where he was in care of the Indians belonging to that agency and the United States troops stationed there; he resigned from this position July, 1861 and removed to St. Peter and entered upon the practice of his profession.

"In 1862 he was appointed assistant surgeon in the Sixth Minnesota Infantry and was with the regiment under General Sibley in the campaign of that year. The first duty required of the doctor by Col. Sibley after joining his regiment was to establish a hospital in St. Peter for the care of those wounded at New Ulm during its defense and all others of the refugees. At that time there were over two thousand people gathered in St. Peter who had escaped from the border and many of them required medical treatment. Within forty-eight hours after the request was made by Col. Sibley, with the prompt assistance of the noble women of St. Peter, there were sixty beds in the old courthouse ready to occupy; after seeing all the wounded provided for he turned the care of the hospital over to his brother, Dr. A. W. Daniels.

"He served as special surgeon of the command under Maj. Joseph R. Brown at the battle of Birch Coulie. In this engagement twenty-two were killed, sixty wounded and eighty-seven horses killed—one-third of the entire command—and where they were thirty-six hours without food, water or sleep. Hon. Charles W. Johnson who was present at the battle, made the following statement which appears in the official record of that engagement:

> 'Assistant Surgeon, Jared W. Daniels, had accompanied Company "A" to Birch Coulie and no man on any battlefield displayed more heroism. On the morning of that fateful 2nd of September he is remembered as going about bareheaded examining and binding up the wounds of the men. He was in great personal danger but seemingly unheedful of it all, he never flinched for a moment, and for thirty-six hours he never ate a morsel of food nor closed his eyes for sleep, so great was the demand upon him.'

"In 1863 the doctor crossed the plains with General Sibley to the Missouri river and participated in the battles of Big Mounds, Buffalo Lake and Stony Lake. On his return to Minnesota he was promoted to Surgeon in the Second Minnesota Cavalry, and again crossed the plains with his regiment in 1864, joining General Sibley on the Missouri, and was with him on his march to the Yellowstone. On this campaign he was present at the battles of Kill Deer Mountain, and Bad Lands. On his return he was stationed at Fort Snelling in charge of the general hospital until he was mustered out in the fall of 1865. Soon after he located at Faribault for the practice of his profession.

"In 1868 Bishop Whipple had money placed in his hands by an act of Congress for the benefit of the Indians at Fort Wadsworth in Dakota. Doctor Daniels being well acquainted with these Indians was selected by the Bishop to go to the Fort to take charge of all supplies and look after the relief of these destitute people. The following year he was appointed by President Grant, Indian Agent for the Indians he had been in charge of the previous year. These were the Upper Sioux under Standing Buffalo who did not join the lower bands at the Lower Sioux Agency in the massacre of 1862. The Doctor established the Sisseton Indian agency, gathered them on the reservation, encouraged them to take lands in severalty, and required them to work for themselves, or at the agency, to pay for everything they received from the Government. When he left them in 1871 all had land under cultivation, were living in houses of their own building, and most of them had discarded their Indian costume; schools were established, a code of laws provided for the government of the people and officers to enforce them, and formed the first police force of Indians in the history of the Government, to patrol the reservation and the frontier, and to surpress the importation and sale of liquor.

"Dr. Daniels was transferred by President Grant to the Red Cloud Agency in Wyoming to pacify the Sioux and other hostile tribes. Here he found about five thousand Indians, consisting of Sioux, Cheyenne and Araphoes, the greater portion of them being in a turbulent state and hostile to the Government. Under the Doctor's generous treatment the number increased by others coming in from the north and south until there was over eight thousand, peaceably disposed, when he left them nearly three years later.

"In the fall of 1873 he was appointed inspector of Indian Agencies, in which capacity he visited the Agencies in Dakota, Minnesota, Montana, New Mexico and Arizona. In 1875 he was sent alone to treat with Red Cloud and Spotted Tail Indians to induce them to give up their rights in the country south of the North Platte river, after the Indian Department in Washington had failed with a delegation of these Indians called there for that purpose. He not only induced them to relinquish their rights, but dictated what they should receive in payment instead of guns and ammunition which they most urgently demanded. In the fall of 1875 he was made disbursing officer on a large Commission sent to treat with the Sioux for the Black Hills. They were unable to make a treaty. The year 1876 he was appointed on a Commission to secure the cession of the Black Hills and a treaty was affected by which the Hills were ceded to the Government. In 1886 he was again appointed on a Commission to make treaties with Indians in Minnesota, Dakota, Montana, Idaho and eastern Washington. Treaties were made with all these tribes by which many million acres of land was relinquished to the Government. He left the Government service in 1887 and returned to Faribault, where he has since resided, until two years ago, when he removed to Los Angeles, California. The Doctor is a member of the Loyal Legion Commandery of Minnesota, and the Grand Army."

DeCousens, John R.—He practiced a time in Dundas. In 1880 he made a report to the Minnesota State Board of Health of Diphtheria in Rice County covering the twelve months of 1 November, 1879-1 November, 1880. He was licensed by an exemption certificate on December 31, 1883. Probably in 1881 he moved to Lanesboro, Fillmore County, and practiced there for several years—at least until 1885 or 1886—and acted as local health officer.**

Denison, Lucius W.—Settled in Faribault about 1850 and was Representative in the Legislature 1878 to 1879. He was born in Brookfield, N. Y., on December 17, 1819.

Denninger, P. J.—A homeopath. He was born in Berlin, Germany, on January 20, 1848, and came to the U. S. with his parents in 1862. He arrived in Minnesota in 1871. Dr. Denninger graduated from Hahnemann Medical College, Chicago, in 1878. He was licensed on 22 April, 1884, and set up his shingle in Faribault this same year.† His office was in the Theopold Block. His card in the weekly newspaper stated that he paid "special attention to the treatment of chronic diseases."

Dight, Charles Fremont.—Graduate of the University of Michigan's Medical School in 1879. He was licensed in Minnesota on October 4, 1889, and came to Faribault where he established his practice. He is no doubt identical with the well-known pioneer in eugenics who fathered the Institute of Eugenics at the University of Minnesota, organized the American Eugenic Society, wrote "Eugenics," "History of the Early Stages of the Organized Eugenics Movement in Minnesota for Human Betterment," et cetera.

He was born in 1856 or 1857 at Mercer, Pennsylvania, and studied medicine at the University of Michigan. For a while he practiced in Michigan then began a career of teaching (University of Michigan, Tulane University, University of Minnesota). Six years he spent in Syria. He died in June, 1933, at the age of eighty years.

Everett, Edward.—There is no record of his being licensed to practice in Minnesota. He practiced at Paynesville, Ohio, and at Racine, Wisconsin, before the outbreak of the Civil War. He was surgeon to the 11th Wisconsin Regiment throughout the four years of the war. He came to Faribault to re-establish his practice in civil life on December 6, 1865. He either died or retired and departed Faribault before the early licenses to practice medicine in Minnesota were first issued in 1883.

**See Nora H. Guthrey, "Notes on the History of Medicine in Fillmore County prior to 1900." MINNESOTA MEDICINE, page 1141, November, 1946.

†He supposedly settled in Faribault as early as 1881, according to a history of Rice County of 1882.

(To be continued in April issue)

Public Health

RECOMMENDED PRACTICES IN THE PREVENTION OF RETROLENTAL FIBROPLASIA*

Incubator oxygen concentrations above 40 per cent are directly associated with the development of retrolental fibroplasia in prematurely-born infants. Available data indicates that the limitation of oxygen to premature infants does not increase neonatal mortality. Oxygen should not be given routinely to premature infants but for the specific indications of cyanoses and respiratory distress.

1. It is recommended that the routine administration of oxygen to premature infants be discontinued. When the physician specifically orders oxygen administration to premature infants, the incubator oxygen concentration should be kept under 40 per cent.

2. To insure incubator oxygen concentration under 40 per cent one of the following devices may be employed:

(a) Melco minus 40 per cent oxygen concentration device which is attached directly to the incubator with metal fittings and makes it impossible to administer oxygen in excess of 40 per cent concentration, regardless of oxygen flow. This is manufactured by the Melchior, Armstrong. Dessau Co., Ridgefield, New Jersey. Price, including humidifier which may or may not be used, for hospitals with piped in oxygen—
Melco 758—$48.50 F.O.B., Ridgefield. New Jersey.
For hospitals without piped in oxygen—
Melco 759—$78.00 F.O.B., Ridgefield, New Jersey.

(b) Analysis of oxygen concentration of incubator between one and two hours after turning on oxygen supply to incubator. There are two types of oxygen analyzers which are simple to operate and operate by means of contained batteries:

(1) The Mira oxygen analyzer OXA-100 is available from the Medical Instrument Research Associates, 2656 N. Pasadena Avenue, Los Angeles 31, California. Price $147.00 F.O.B. Los Angeles, California.

(2) The Arnold O. Beckman Model D oxygen analyzer is available from Arnold O. Beckman, Inc., 1020 Mission Street, South Pasadena, California. Price $190.00 F.O.B. South Pasadena, California.

(c) If the Melco minus 40 per cent oxygen concentration device is used, it is not necessary to use an oxygen analyzer. It is felt that the Melco device is more desirable and easier to use than the oxygen analyzers.

Minnesota Department of Health
Section of Maternal and Child Health

CURRENT CARDIAC CONCEPTS

The Value of Prolonged Anticoagulant Therapy

(Continued from Page 39)

coagulant therapy is far outweighed bv the benefits obtained. It must be emphasized that it should not be undertaken by any physician who is unwilling to thoroughly acquaint himself with these details, who is not fully cognizant of the hemorrhagic possibilities involved, who has not available the services of a dependable technician well trained in determining the prothrombin time, and who has a patient insufficiently intelligent and cooperative to understand the program and cooperate in its administration.

In conclusion, the use of long-term anticoagulant therapy in selected conditions is discussed and advised. It is rapidly being broadly accepted as a valuable addition to therapy. It demands meticulous care in its administration but is rewarding in the reduction of morbidity and mortality which it effects.

Bibliography

1. Wright, I. S., Bourgain, R., Foley, W. T., McDevitt, E., Gross, C., Burke, G., Simon, E., Lieberman, J., Symons, C., and Huebner, R.: Long-term anticoagulant therapy. Circulation, 9:748 (May) 1954.
2. Nichol, E. S., and Borg. J. F.: Long-term dicumarol therapy to prevent recurrent coronary artery thrombosis. Circulation, 1:1097 (May) 1950.
3. Bay, E. B., Adams, W. R., Jones, R. J., Page, R. G., and Seide, M.: The use of anticoagulant drugs in ambulatory patients. Circulation, 9:741 (May) 1954.
4. Keyes, J. W., Drake, E. H., James, T. N., and Smith, F. J.: Survival rates after myocardial infarctions with and without long term anticoagulant therapy. Am. J. M. Sci., 226:607 (Dec.) 1953.

---

*Approved by the Council of the Minnesota State Medical Association, October 1, 1955.

Miscellaneous

AMA DELEGATES' REPORT

Taciturnity, traditionally endemic to New England, isn't communicable to visitors. That is our conclusion after participating in a round of proposing, debating, resolving, commending, and condemning at this year's House of Delegates meeting in Boston. In three days, the doctors talked their way through thirty-seven resolutions and about 400 pages of reports.

Nine years ago, the AMA set up the midwinter sessions to appeal to the general practitioner—and this was his year. Several protests of general practitioners were put into one resolution which calls for:

1. AMA representatives on the Joint Commission on Accreditation of Hospitals to seek punitive action against hospitals which exclude or arbitrarily restrict hospital privileges for general practitioners as a class, regardless of their individual professional competence, after appeal to the Commission by the county medical society concerned.

2. A new and continuing Committee on Medical Practice of five members (including three general practitioners) to study the relative value of diagnostic, medical and surgical services; stimulate the formation of departments of general practice in each medical school; help the AMA's public relations department educate the public on "all of medicine"; and to "use its full influence to discourage arbitrary restrictions by hospitals against general practitioners as a group or as individuals."

There was more. After the report of the Committee on Medical Practices had been heard, the House of Delegates ordered:

1. An education program to increase the public's appreciation of non-surgical work.
2. A reappraisal of the practice restrictions of the various specialty boards.
3. That the American Hospital Association and any other interested groups be told that organized medicine is ready, willing and able to solve its own problems.

Liability Insurance Studied

The AMA committee studying professional liability insurance made a progress report. Tentative conclusions from a survey indicate that liability claims are most frequently caused by x-ray burns, foreign body left in patient after surgery, imperfect results from orthopedic surgery, failure to obtain consent prior to surgery, inaccurate prescription of drugs or improper diagnosis, criticism of one M.D. by another, excessive fees, and a poor doctor-patient relationship. The full report, due next year, should serve as a basis for action to decrease the causes and number of liability claims. If this can be done, it is reasonable to assume that this type of insurance will become more widely available at a reasonable cost.

The failure of voluntary contributions to raise sufficient funds for the American Medical Education Foundation has led to the prospect of an increase in AMA dues. The money would be earmarked for the AMEF.

Besides the delegates, representatives from Minnesota included President-elect R. H. Wilson, M.D., Winona, and R. R. Rosell, executive secretary. Others were Drs. Edgar V. Allen, Robert R. Kierland, Clark H. Millikan, Jack P. Whisnant, Howard A. Andersen, William L. Benedict, R. O. Brandenburg, Daniel C. Connolly, Victor Johnson, Byrl R. Kirklin, Frank R. Krusen, R. G. Sprague, and Edward N. Tihen, all of Rochester. Doctors Harold E. Coulter, Madelia; Harold S. Diehl, Minneapolis; Reuben Erickson, Minneapolis; J. C. Jacobs, Willmar; H. B. Sweetser, Minneapolis; Charles C. Cooper, Saint Paul, and Harry B. Hall, Edina, also attended.

Full details of the meeting will be printed in *The Journal of the AMA,* starting with the December 10 issue. Here is a brief recapitulation of some of the highlights:

AMA condemned free polio vaccine "except for those unable to pay"; distribution should be through usual channels hereafter.

A complete revision of the Principles of Medical Ethics is in the offing. The proposal will be circulated to every AMA member before the June, 1956, meeting in Chicago.

A guide for establishing local grievance committees was approved. Copies will be sent to all societies; but before a county society sets up such a committee, it is urged to contact the state secretary's office for further help and advice.

Licensure of clinical psychologists was opposed.

The AMA will get behind a new plan to interest medical men in military careers. If successful, this could eliminate need for draft.

The AMA Board of Trustees was instructed to figure out how to deal with new and unconfirmed methods of diagnosing and treating cancer. Cancer commissions run by state medical societies were suggested.

A resolution offered by the North Central Medical Conference commended Iowa physicians for their successful initial effort to establish that the

(Continued on Page 67)

In Memoriam

SAMUEL H. BOYER

Dr. Samuel H. Boyer, Sr., former president of the Minnesota State Medical Association and pioneer Minnesota physician, died November 12, 1955. He was eighty-nine years old.

Born in Oil City, Pennsylvania, Dr. Boyer was graduated from the University of Pennsylvania medical school in 1890. He started his practice in Duluth in 1891. He was active in many civic affairs besides being a leader in his profession. He was St. Louis County coroner, and served two terms on the Duluth board of education. The system of medical examination for school children which he instituted is in force today.

Dr. Boyer had been president of the St. Louis County Medical Society and was former chief of staff of St. Luke's Hospital.

In 1950, he was presented with the Distinguished Service Award of the State Medical Association by Dr. O. J. Campbell who said:

"Dr. Samuel H. Boyer, Sr., has been an active participant in medical affairs for many years. He has been a member of the State Board of Health and was appointed a member of the Basic Science Board. He was elected president of the Minnesota State Medical Association for 1930 and has served as a councilor, a committee chairman, and as a state delegate.

"Dr. Boyer, this citation is well-deserved acknowledgment from your colleagues of the many years of meritorious service you have given to the field of medicine."

Dr. Boyer is survived by a son, Dr. Samuel H. Boyer, Jr.; a daughter, Mrs. Donald Parmalee, Beverly Hills, California, and three grandchildren.

CHARLES FAY BRIGHAM, SR.

Dr. Charles F. Brigham, Sr., who had practiced medicine in St. Cloud for fifty-two years, died October 15, 1955. He was seventy-nine years old.

Born in Lancaster, Wisconsin, Dr. Brigham moved to St. Cloud with his father, Dr. George S. Brigham, in 1878. He graduated from the University of Minnesota medical school in 1902, and interned at St. Mary's Hospital in Duluth.

He began his practice in St. Cloud in 1903. He served as city physician and at the time of his death was the oldest practicing physician in St. Cloud.

Dr. Brigham was a life member of the Minnesota State Medical Association, the American Medical Association and the Stearns-Benton County Medical Society. He was a "Fifty Club" member of the State Association. He was also a member of Nu Sigma Nu, medical fraternity.

He is survived by his wife; a son, Dr. C. F. Brigham, Jr.; and two grandchildren, all of St. Cloud. His sister, Mrs. Florence D. Colbert, lives in St. Paul.

RALPH H. CREIGHTON

Dr. Ralph H. Creighton, Minneapolis physician, died November 11, 1955, at the age of fifty-seven. He was chief of staff at Abbott Hospital.

Dr. Creighton was born in Minneapolis and practiced there from the time of his graduation from the University of Minnesota in 1923, except for a period of war service with the 34th infantry.

Dr. Creighton was chairman of the Committee on Veterans' Affairs of the Minnesota State Medical Association. He was a member of the American Medical Association and, in 1947, was president of the Hennepin County Medical Society. He was a member of the Minnesota Academy of Medicine and the American Academy of General Practice.

Non-medical groups, of which he was a member, included the Masons, Delta Upsilon and Nu Sigma Nu fraternities, the University Club and St. Paul's Episcopal Church.

Surviving are his wife; two sons, James G. of Minneapolis and John E. of Dallas, Texas, and his mother, Mrs. Clare Rees Creighton, Minneapolis.

CHARLES E. DUTTON

Dr. Charles E. Dutton, ninety-four, a member of the first class to be graduated from the University of Minnesota medical school, died Noevmber 5, 1955. Dr. Dutton, who carried on his practice in his home office in Minneapolis until recently, was the only surviving member of the class of 1889.

He was a member of the Hennepin County Medical Society, the Minnesota State Medical Association and was elected an affiliate fellow in the American Medical Association in 1929. He served as Minneapolis health commissioner in 1914 and 1915.

Dr. Dutton bought a car in 1902 and became the first physician in Minneapolis to visit country patients in a horseless carriage. He rebuilt this Locomobile Steamer, sold to him by Dr. Charles Mayo, and won a race attaining the terrific speed of 30 miles an hour. He was an early trustee of the Automobile Club of Minneapolis, president of the Minnesota Automobile Association and a director of the Twin City Motor Speedway.

Survivors include his wife, and a daughter, Mrs. Lowell M. Canfield, St. Louis Park.

REINHOLD MILTON ERICSON

Dr. Reinhold Ericson, fifty-three, died November 20, 1955. He had been an eye, ear, nose and throat specialist in Minneapolis until his retirement in 1951.

Born in Lafayette, Minnesota, Dr. Ericson was graduated from Washington University medical school, St. Louis, Missouri. He interned in Baltimore and took postgraduate work in Vienna. He was a veteran of World War II.

Dr. Ericson was a member of Westminister church, the Minneapolis Athletic Club, Lafayette Club, the Hennepin County Medical Society, the Minnesota State Medical Association and the American Medical Association. He was also a member of the American College of Surgeons and the International College of Surgeons.

His survivors include his wife; a son, John; a daughter, Mrs. Byron Anderson; two grandchildren, and his mother, Mrs. J. G. Ericson, all of Minneapolis.

RAYMOND F. HEDIN

Dr. R. F. Hedin, surgeon of Red Wing, died October 21, 1955, after a brief illness. He was forty-nine years old.

Dr. Hedin spent his early boyhood in Sioux City, Iowa. He attended schools in Red Wing before taking undergraduate study at the University of North Dakota. He graduated from the University of Minnesota medical school in 1930 and interned at the University Hospital. He spent a year each at Cook County Hospital and Wesley Memorial Hospital in Chicago as a resident in surgery and another year at Chicago Presbyterian as a resident in urology. During this time, he wrote a prize-winning essay on "Polypoid Disease of the Colon" which received an award from the Chicago Surgical Society.

The Goodhue County Medical Society, the Southern Minnesota Medical Association, the Minnesota State Medical Association and the American Medical Association were among his professional affiliations. In 1950, he was president of the Southern Minnesota Association. He was also a member of the Minnesota Medical Foundation, the Central Surgical Society, a fellow of the American College of Surgeons and a diplomate of the American Board of Surgery.

Dr. Hedin was active in civic affairs also. He served as mayor of Red Wing from 1945 to 1949. He was president of the Red Wing Junior Chamber of Commerce and a leader in the Democratic-Farmer Labor party.

Dr. Hedin is survived by his wife; his daughter, Barbara; three sons, Douglas, Thomas and Robert; and his mother, Mrs. Carl K. Reckner.

JOHN BURTON HOLST

Dr. John B. Holst, for many years a physician in Little Falls, died October 17, 1955, in Minneapolis. He was eighty-three years old.

Dr. Holst was born in Goodhue County in 1871. After graduating from the medical school of the University of Minnesota, he practiced briefly at Lake Benton before going to Little Falls and setting up a partnership with his brother, Dr. Fred Holst. Both retired in 1947.

He was a member of the Upper Mississippi Medical Society, the Minnesota State Medical Association and past president of the Northwest Medical Association. For many years, he was district surgeon for the Northern Pacific railway.

His daughter, Mrs. Platt Nellermoe, Wayzata, survives him. He is also survived by his brothers Henry, Austin; William, Red Wing; Alwyn, Coleraine; and a sister, Clara Holst, St. Paul.

WALTER J. MARCLEY

Dr. Walter J. Marcley, born at Franconia, Minnesota, in 1867, died November 8, 1955, in Minneapolis. He had been a pioneer and leader in the study and treatment of tuberculosis. He was one of the founders of the National Tuberculosis Association.

Dr. Marcley taught school for several years after graduating from the University of North Dakota. He then entered Boston University medical school and received his degree in medicine in 1895. He served his internship at Millard Fillmore Hospital in Buffalo and entered general practice in New York state.

In 1897, he became a student at Dartmouth College and was awarded another degree in medicine in 1902. While attending Dartmouth, he was affiliated with the Massachusetts State Sanatorium at Rutland and became superintendent of that institution.

He remained there until 1907 when he returned to Minnesota to assume direction of the Minnesota State Tuberculosis Sanatorium at Walker. In 1911, he entered private practice in Minneapolis, but remained active in the fight against tuberculosis. He was chief of the tuberculosis service at General Hospital in Minneapolis from 1912 to 1922 and medical director of Glen Lake Sanatorium from 1916 until he went to France with the Rockefeller Tuberculosis Commission. In 1919, he became chief physician for the Red Cross in Switzerland. When he returned to the United States, Dr. Marcley took over the post of Chief of the Tuberculosis Service for the Veterans Bureau at Thomas Hospital in Minneapolis and later at the Veterans Administration Hospital at Fort Snelling.

Dr. Marcley joined the medical staff at Nopeming Sanatorium and worked there from 1937 until 1941. For many years, he was on the staff of the Minnesota Department of Health as consultant in tuberculosis.

Dr. Marcley was a life member of the Minnesota State Medical Association and the St. Louis County Medical Society. He was a member of the National Tuberculosis Association, the American Sanatorium Association, the International Union Against Tuberculosis, the Minnesota Trudeau Society and the American Academy of Tuberculosis Physicians.

Survivors include his son, Dr. David M. Marcley of Amarillo, Texas, and two sisters, Mrs. Edward F. Cushman, Palmer, Massachusetts, and Mrs. Mamie Alley, Minneapolis.

SAMUEL MILLER

Dr. Samuel Miller, radiologist at Naeve Hospital in Albert Lea from 1950 to 1954, died October 12, 1955, in Jamestown, North Dakota, where he was practicing.

Dr. Miller was born in Russia in 1905. He attended St. Paul schools and received his medical education at the University of Minnesota. After his graduation in 1929, he practiced for ten years in North and South Dakota and then served for six years with the U. S. Army. He took postgraduate work in radiology at the University of Minnesota before going to Albert Lea.

He was a member of the Freeborn County Medical

Society, the Minnesota State Medical Association and the American Medical Association.

He is survived by his mother, wife, and two brothers, all of Bismarck, North Dakota.

ROBERT LYMAN NELSON

Dr. Robert L. Nelson, Duluth internist, drowned accidentally on November 12, 1955, while vacationing in Florida. He was fifty-five years old.

Dr. Nelson was born in Chicago. He attended Northwestern University medical school, graduating in 1925. He opened his practice in Duluth in 1927, specializing in internal medicine and cardiology. He was a member of the staff of St. Mary's, St. Luke's and Miller Memorial Hospitals. He was chief of staff of St. Luke's Hospital in 1951.

Dr. Nelson was a member of the St. Louis County Medical Society, the Minnesota State Medical Association, the American Medical Association, the Duluth Society of Internal Medicine, and the American Heart Association. He was a diplomate of the American Board of Internal Medicine.

Survivors are his wife; his daughter, Phyllis, Duluth; his mother, Mrs. A. M. Nelson, Chicago; a sister, Mrs. A. H. East, Chicago; and a brother, Ray.

BURT FRANK OSBURN

Dr. B. F. Osburn, physician of International Falls until he retired in 1940, died October 11, 1955. He was eighty-five years old.

Dr. Osburn was a graduate of Hamline University and the University of Minnesota medical school. He practiced in Baudette before establishing a practice in International Falls in 1919. He was administrator of the Northern Minnesota Hospital for many years.

Dr. Osburn was a member of the Upper Mississippi Medical Society and the Minnesota State Medical Association.

Mrs. Osburn is the only immediate survivor.

HENRY WILLIAM QUIST

Dr. Henry W. Quist, general surgeon of Minneapolis since 1908, died November 6, 1955, at the age of seventy-six. He collapsed on the University campus where he had planned to attend a lecture.

Dr. Quist was born in Chisago City. He attended Gustavus Adolphus College and Hamline University and graduated from the medical school of the University of Minnesota in 1907. He interned at Swedish Hospital where he later served on the staff. In 1924, he was chief of staff.

He served on the board of the American Swedish Institute, was a member of Zion Lutheran church, the Minneapolis Athletic Club, the Minneapolis Automobile Club, the Masons and the Scottish Rite.

Dr. Quist was a life member of the Hennepin County Medical Society, the Minnesota State Medical Association, the American Medical Association and was a fellow of the American College of Surgeons.

He is survived by his wife and his son, Dr. Henry W. Quist, Jr. His two sisters, Mrs. Frances Hedlund, Paynesville, and Mrs. Anna Shogren, Minneapolis; a brother, Otto, Minneapolis, and five grandchildren are other surviving relatives.

JOHN ALOIS THABES

Dr. John Thabes, fifty-four, widely-known Minnesota physician and Crow Wing county coroner for twenty years, died October 14, 1955.

Dr. Thabes was born in Brainerd and was graduated from the University of Minnesota medical school in 1925. He served his internship at St. Mary's Hospital in Duluth, and entered into practice with his father, Dr. John Thabes, Sr., in 1926.

A fellow in the American College of Surgeons, Dr. Thabes was also a member of the Upper Mississippi Medical Society, the Minnesota State Medical Association and the American Medical Association. He was a member of the Masons and the Elks.

He is survived by his wife; two sons, John, St. Paul, and Rudd, Brainerd; three daughters, Mrs. John Gilbert, Cucuta, South America; Mrs. John Schmidtke, Elgin, Illinois; and Tamara, Brainerd; four grandchildren, and a sister, Mrs. Lois Adelaide Hensley, Tulsa, Oklahoma.

HOWARD H. WOLFE

Dr. Howard Wolfe, who practiced medicine in Saint Paul from 1921 to 1940, died November 9, 1955, in San Francisco. He was fifty-five years old.

Dr. Wolfe entered the Army Medical Corps in 1940. He served for six years and then joined the Veterans Administration. He became chief medical officer of Northern California and was holding that post at the time of his death. In October, 1955, Veterans Administration officials presented him with the "exceptional service award," highest award ever given by the Administration.

He was a past commander of the Business and Professional Men's post of the American Legion in Saint Paul.

Survivors are his wife; a daughter, Mrs. Audrey Gruettenden of Los Gatos, California; a son, Dennis H. of San Francisco; and a brother, John I. of Los Angeles.

A program of research into the cause and prevention of heart disease should be undertaken on international lines under the auspices of the World Health Organization (WHO) according to the recommendations made by the WHO Study Group on Atherosclerosis which met in November in Geneva under the chairmanship of Dr. Herman Hilleboe, New York State Commissioner of Health.

The disease recommended for special investigation, "because of its paramount importance as a public health problem" is ischemic heart disease, defined by the WHO Study Group as "the cardiac disability, acute and chronic, arising from reduction or arrest of blood supply to the myocardium . . . the result of disease processes in the coronary arterial system. The main pathological processes involved are atherosclerosis and thrombosis of these vessels."

The most clearly recognized types of ischemic heart disease are myocardial infarction due to coronary obstruction (angina pectoris).—WHO News Release.

Reports and Announcements

MEDICAL MEETINGS

State

Minnesota State Medical Association, annual meeting, Mayo Civic Auditorium, Rochester, Minnesota, May 21-23, 1956.

National

Congress on Industrial Health, 16th annual meeting, Sheraton-Cadillac Hotel, Detroit, Michigan, January 23-24, 1956.

American College of Surgeons, sectional meeting, Hotel Schroeder, Milwaukee, Wisconsin, February 27-29, 1956. Dr. Forrester W. Raine, Milwaukee, chairman.

Atlanta Graduate Medical Assembly, Biltmore Hotel, Atlanta, Georgia, February 20-22, 1956.

Mediclinics of Minnesota, postgraduate course sponsored by Academy of General Practice of Broward County, Fort Lauderdale, Florida, March 5-14, 1956.

INTERNATIONAL COLLEGE OF SURGEONS

Regional Meetings

Four regional meetings of the United States and Canadian Sections, International College of Surgeons, are scheduled for 1956.

The first, the Mid-Atlantic Region, meeting will be held at the Green Brier Hotel, White Sulphur Springs, West Virginia, February 13-15. This will be followed by a meeting March 22-23 in San Jose, California. A Southeastern regional meeting will be held in the Read House, Chattanooga, Tennessee, April 30-May 1, and a New England regional meeting in the Marshall House, York Harbor, Maine, over the July 4 weekend.

In Chicago on September 9-13 the Tenth Congress of the International College of Surgeons will be held in conjunction with the Twenty-First Congress of the United States and Canadian sections. Headquarters will be in the Palmer House.

For further information, write the Secretariat of the United States Section, International College of Surgeons, 1516 North Lake Shore Drive, Chicago 10, Ill.

Examinations for Fellows

Four oral and four written examinations for Fellows in the United States Section of the International College of Surgeons will be conducted in 1956.

Oral conferences will be held on January 23, April 16, August 6 and October 22. The written examinations will be conducted on January 30-31, April 23-24, July 23-24 and October 29-30. These will be held at the Cook County Hospital and Cook County Graduate School of Medicine, Chicago.

PAN AMERICAN MEDICAL WOMEN'S ALLIANCE

The Fifth Congress of the Pan American Medical Women's Alliance will be held in Santiago and Vina del Mar, Chile, March 6 to 13, 1956. Also planned is a trip to include visits to hospitals and medical clinics in Mexico, San Salvador, Panama, and southern Chile under the guidance of some of the Chilean women doctors. Following the Congress a week will be spent in La Paz, Bolivia, visiting medical projects among the Incas. En route to Lima, there will be a trip across Lake Titicaca and ample opportunity to explore the archeologic treasures of Cuzco and Macchu Picchu.

Program chairman is Dr. Eva Cutright, Wooster, Ohio.

AMERICAN ACADEMY OF GENERAL PRACTICE

The Eighth Annual American Academy of General Practice Scientific Assembly will be held March 19-22, 1956, in the Washington, D. C., Armory.

During the four-day scientific meeting twenty-six outstanding speakers will discuss subjects ranging from cardiac emergencies to primary wound repair. There will be more than 60 scientific and 250 technical exhibits. Highlights of the program will include two live clinics, a symposium on obstetrics and an address by Surgeon General Leonard Scheele. Special tours through the National Institutes of Health, Bethesda, Maryland, have been arranged.

AMERICAN INSTITUTE OF DENTAL MEDICINE

The American Institute of Dental Medicine continues to offer Case Histories from the broad field of dental medicine for the year 1955-56. These include original 35 mm. Kodachrome slides of the oral condition, pertinent laboratory findings, medical background, roentgenograms, histologic slides, photomicrographs, diagnostic criteria and whatever else may be indicated in each individual case. A loose leaf binder and matching Kodachrome slide box are furnished each participant.

For further information write the Secretary, Mrs. C. Novembri, 2240 Channing Way, Berkeley 4, California.

HAWAII MEDICAL ASSOCIATION

Hawaii Medical Association, 100th anniversary meeting, Honolulu, Hawaii, April 22-29, 1956. For reservation applications, write Hawaii Medical Association, 510 South Beretania Street, Honolulu 13, Hawaii.

General Practice Review, postgraduate course sponsored by clinical departments and Office of Postgraduate Medical Education, University of Colorado Medical Center, 4200 East Ninth Avenue, Denver 20, Colorado, January 16-21, 1956.

CLINICAL REVIEWS AT MAYO CLINIC

A three-day program entitled Clinical Reviews will be held by the Mayo Clinic and Mayo Foundation at Rochester, April 9, 10 and 11. The program will consist of lectures and discussions on problems of general medicine and surgery. Presentations will be made by staff members of the Mayo Clinic and Mayo Foundation for Medical Education and Research.

The number of physicians who can be accommodated is limited. For further information, write R. C. Roesler, Mayo Clinic, Rochester, Minnesota. There are no fees for the session.

MINNEAPOLIS OBSTETRICAL AND GYNECOLOGICAL SOCIETY

The Minneapolis Obstetrical and Gynecological Society was organized at a dinner meeting held at the Minneapolis Club the evening of October 26, 1955. Officers elected at that time are: John A. Haugen, M.D., President; Rae T. La Vake, M.D., Vice President; and Francis M. Swain, M.D., Secretary-Treasurer. John L. McKelvey, M.D., and James Shandorf, M.D., were elected to serve with the officers on the Executive Council.

Present plans include holding meetings four or five times during the year.

CONTINUATION COURSES

The University of Minnesota announces a continuation course in *Eye, Ear, Nose, and Throat for General Physicians* which will be presented at the Center for Continuation Study from February 27 to 29, 1956. The most commonly seen problems in this field will be discussed and treatment will be stressed. The course will be presented under the direction of Dr. L. R. Boies, clinical professor and head of the Department of Otolaryngology, and Dr. Erling W. Hansen, clinical professor and head of the Department of Ophthalmology.

* * *

The University of Minnesota announces a continuation course in *Dietetics for Dietitians* at the Center for Continuation Study next March 1 to 3, 1956. Recent advances in the field will be stressed. The course will be presented under the direction of Miss Angeline D. Mannick, director of nutrition and associate professor of dietetics.

* * *

A continuation course in *Pediatrics for General Physicians* will be presented by the University of Minnesota at the Center for Continuation Study on March 5 to 7, 1956. Guest faculty will include Dr. Katharine Dodd, professor of pediatrics, University of Arkansas School of Medicine, who will also deliver the annual Phi Delta Epsilon Lecture on Tuesday evening, March 6. The course will be presented under the direction of Dr. John A. Anderson, professor and head, Department of Pediatrics.

* * *

The University of Minnesota, in conjunction with the Minnesota Heart Association, will present a continuation course in *Cardiovascular Disease for General Physicians* at the Center for Continuation Study from March 19 to 21, 1956. Management of the more frequently seen cardiovascular disorders will be stressed. Guest speaker will be Dr. Hans Hecht, Associate Professor of Medicine, University of Utah College of Medicine, Salt Lake City. The course will be presented under the direction of Dr. C. J. Watson, Professor and Head, Department of Medicine.

THE MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

230 Lowry Medical Arts Building
Saint Paul 2, Minnesota

F. H. Magney, M.D., Secretary

MONTEVIDEO MAN SENTENCED ON ABORTION CHARGE

Re: State of Minnesota vs. Omer Peterson

On December 5, 1955, Omer Peterson, thirty-six, 913 N. Fourth Street, Montevideo, Minnesota, was sentenced in district court there by the Hon. Sam G. Gandrud, Judge of the District Court, to a term of not to exceed four years in the State Reformatory for Men at St. Cloud, Minnesota, pursuant to his plea of guilty to an information charging him with the crime of abortion, which plea had been previously entered before Judge Gandrud on October 17, 1955. The execution of the sentence was stayed, however, and the defendant was placed on probation in the custody and control of the State Board of Parole. One of the conditions of the probation prescribed by the Court was that Peterson shall be of good behavior and comply with and abide by all the rules and regulations that may be prescribed by the State Parole Board or any of its agents.

The defendant was arrested at Montevideo on July 5, 1955, and charged with the crime of abortion in a complaint issued on the same date, after a twenty-three-year-old Minneapolis divorcee had been hospitalized at University Hospital in Minneapolis suffering from the aftereffects of an abortion. In a signed statement given to the authorities, Peterson, who said that he was a salesman for an air-conditioning and heating firm, admitted that he had attempted to perform an abortion upon the same woman about a year or two previously in Sioux Falls, South Dakota, by using a plastic drinking tube about 10 inches long. According to the defendant's statement, a similar instrument was used in performing the most recent abortion, which took place in a Montevideo hotel room on June 20, 1955. Peterson was paid the sum of $50.00 for his services in connection with this case. The defendant has no medical training and holds no license to practice any form of healing in the State of Minnesota.

AMA DELEGATES' REPORT

(Continued from Page 62)

practice of medicine (pathology and radiology) by hospitals is illegal.

AMA will ask the Federal Government to regulate safety standards of automobile construction.

Interim Session in Minneapolis

The Board of Trustees has accepted the invitation of the North Central Medical Conference to hold the Interim Session of 1958 in Minneapolis. This will be a splendid opportunity for large numbers of doctors in the upper Midwest to attend one of the clinical meetings.

J. Arnold Bargen, M.D., Rochester
George Earl, M.D., Saint Paul
O. J. Campbell, M.D., Minneapolis
F. J. Elias, M.D., Duluth
Delegates to the American Medical Association

Woman's Auxiliary

RADIO AS A PUBLIC HEALTH SERVICE

Mrs. O. M. Heiberg, Worthington

"Does Johnny Make the Team?", "Rabies," "Mental Health in Child Development," and "The Promise of Geriatrics" are among the various subjects discussed on "Your Health Hour," a 15-minute health information program on the air each Sunday afternoon, over radio station KWOA, Worthington, Minnesota.

This program is the outgrowth of the first rural "Health Day" held in Worthington, Minnesota, in February, 1949. The Southwestern Minnesota Medical Society, together with its Woman's Auxiliary and District V of the Minnesota Department of Health, have just completed seven years of weekly broadcasts as a public service to the community.

A committee composed of doctors, auxiliary members, and the advisory nurse of District V, Minnesota Department of Health, meet quarterly to plan the programs. Live broadcasts are used as well as "platters" obtained from the American Medical Association.

In planning the content of the programs, the particular interests of the six-county area are given consideration. For example, an outbreak of rabies in the area gave accent to a broadcast on that subject. Brucellosis is also of special interest here, so a program on that subject seemed pertinent. Since there is usually some National Health emphasis each month, a program on the monthly theme being sponsored with a live broadcast using a physician, nurse and/or layman from the area. The three organizations also give support to the school health program and co-operate with the school health councils by giving timely broadcasts on subjects at their request. When local groups are promoting Mantoux and Brucellosis tests, pasteurization of milk, safety programs, et cetera, the group has been on hand with live broadcasts to further emphasize the value of these public health services.

Using spot announcements to list the radio programs and the speakers has been the most effective method of alerting the listening audience to the programs. Posters have been used in physicians' offices, hospitals, and public meeting centers; but as they are seldom kept up to date, they are not being used at present.

Doctors and nurses, as well as lay people, have been enthusiastic and willing to co-operate when requested to participate in live broadcasts.

When the Minnesota Department of Health is able to provide a script writer and live broadcasts are used, the interest is much greater. This is shown in the number of letters and comments brought to the attention of the committee.

In summary, this broadcasting project has been a great success and well worth the effort. It is with pleasure that the Worthington group announces an expansion of the program. On January 8, 1956, the Southwestern Minnesota Medical Society, its Woman's Auxiliary, and District V of the Minnesota Department of Health congratulated Station KLOH, Pipestone, Minnesota, on starting a similar Sunday afternoon program to be called "Your Health Hour."

RAMSEY COUNTY AUXILIARY NEWS

Mrs. Lucian G. Culver, Saint Paul

Members of the Ramsey County Medical Auxiliary have been busy the past month assisting the Fourth District Nurses with their Nursing Recruitment Program. Their part in the program was to drive the student nurses to the various junior and senior high schools in Saint Paul.

Twice a year, student nurses from the different hospitals in Saint Paul present a panel discussion to these students. The purpose of the program is to acquaint the students with the various types of nursing. The panel consists of a moderator and a student from each class of the nursing profession. This includes the practical nurse, the three-year nurse and the degree nurse.

Mrs. R. K. Grau, chairman of the career committee for the auxiliary, reports that the students are very much interested in this program, and many students have been recruited on the strength of it.

The month of December is the time for the Christmas Seal sale throughout the country. A great many auxiliary members volunteered to staff Christmas Seal sale booths in the downtown area on the day specified for the auxiliary.

Speaking of Christmas Seals, four Ramsey County Auxiliary members participated in the quiz program devoted to the Christmas Seal sale which appeared on the "Cash and Carry" program on KSTP television recently. Twenty dollars, collected by the clever foursome, was donated to the Tuberculosis Association.

LABORATORY AIDS

Acute Infectious Hepatitis

(Continued from Page 38)

of serum. If at that time less than 5 per cent of sulfobromophthalein is retained in 45 minutes, the patient may resume normal activity. These two tests are repeated after two to four weeks.

3. If retention of the dye becomes stabilized consistently at 5 to 10 per cent, the patient may be dismissed. If values remain increased or if they fluctuate, individualized management in each case is indicated. Hepatic biopsy may be necessary.

4. Abnormal results of liver function tests may recur after they have become normal. The patient may have to be reconfined in such instances.

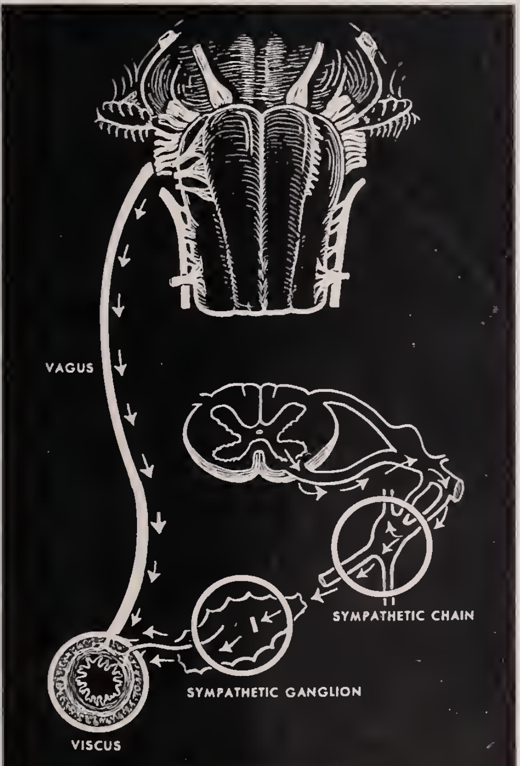
PRO-BANTHĪNE® FOR ANTICHOLINERGIC ACTION

A Combined Neuro-Effector and Ganglion Inhibitor

Pro-Banthīne consistently controls gastrointestinal hypermotility and spasm and the attendant symptoms.

Pro-Banthīne is an improved anticholinergic compound. Its unique pharmacologic properties are a decided advance in the control of the most common symptoms of smooth muscle spasm in all segments of the gastrointestinal tract.

By controlling excess motility of the gastrointestinal tract, Pro-Banthīne has found wide use[1] in the treatment of peptic ulcer, functional diarrheas, regional enteritis and ulcerative colitis. It is also valuable in the treatment of pylorospasm and spasm of the sphincter of Oddi.



Sites at which Pro-Banthīne inhibits excess autonomic stimuli through control of acetylcholine mediation.

Roback and Beal[2] found that Pro-Banthīne orally was an "inhibitor of spontaneous and histamine-stimulated gastric secretion" which "resulted in marked and prolonged inhibition of the motility of the stomach, jejunum, and colon. . . ."

Therapy with Pro-Banthīne is remarkably free from reactions associated with parasympathetic inhibition. Dryness of the mouth and blurred vision are much less common with Pro-Banthīne than with other potent anticholinergic agents.

In Roback and Beal's[2] series "Side effects were almost entirely absent in single doses of 30 or 40 mg. . . ."

Pro-Banthīne (β-diisopropylaminoethyl xanthene-9-carboxylate methobromide, brand of propantheline bromide) is available in three dosage forms: sugar-coated tablets of 15 mg.; sugar-coated tablets of 15 mg. of Pro-Banthīne with 15 mg. of phenobarbital, for use when anxiety and tension are complicating factors; ampuls of 30 mg., for more rapid effects and in instances when oral medication is impractical or impossible.

For the average patient one tablet of Pro-Banthīne (15 mg.) with each meal and two tablets (30 mg.) at bedtime will be adequate. G. D. Searle & Co., Research in the Service of Medicine.

---

1. Schwartz I. R.; Lehman, E.; Ostrove, R., and Seibel, J. M.: Gastroenterology *25:*416 (Nov.) 1953.
2. Roback, R. A., and Beal, J. M.: Gastroenterology *25:*24 (Sept.) 1953.

Clinical trial packages of Pro-Banthīne and the new booklet, "Case Histories of Anticholinergic Action," are available on request to . . .

SEARLE

P. O. Box 5110-B-18
Chicago 80, Illinois

General Interest

Minnesota physicians are invited to submit items of "general interest" concerning themselves or their colleagues to MINNESOTA MEDICINE, 2642 University Avenue, Saint Paul. Only the facts are needed—who? what? where? when? why?—since items will be rewritten for conformity of style.

* * *

Dr. J. Arnold Bargen, head of a section of medicine at the Mayo Clinic, Rochester, and professor of medicine in the Mayo Foundation, has been elected president of the staff of the Mayo Clinic. Other officers elected at the annual meeting of the staff on November 21 include **Dr. Winchell McK. Craig,** vice president; **Dr. David G. Pugh,** re-elected secretary, and **Dr. Kendall B. Corbin** and **Dr. L. O. Underdahl,** councillors. Named to the board of governors were **Dr. Mark B. Coventry** and **Dr. William H. Dearing.**

* * *

Dr. E. C. Burseth, Mora, was elected president of the Mora Commercial Club at the organization's meeting on November 14.

* * *

Dr. S. Marx White, Minneapolis, has submitted his resignation as a member of the Glen Lake Sanatorium commission. He served on the commission for thirty-one years.

* * *

Principal speaker at a meeting of the Rotary Club in Little Falls on November 17 was **Dr. G. M. A. Fortier,** Little Falls. He discussed the contributions made by laymen to modern medical science.

* * *

Dr. H. F. Helmholz, Sr., Rochester, emeritus member of the pediatrics staff of the Mayo Clinic, has been named to a committee to outline plans for a state organization for better recognition and encouragement of exceptional talent in Minnesota youngsters.

* * *

During the middle of November, **Dr. H. P. Hinderaker,** Bird Island, attended a two-week postgraduate course at the Cook County Graduate School of Medicine, Chicago.

* * *

Dr. O. E. Wandke, Fairmont, was elected president of the Blue Earth Valley Medical Society at a meeting in Blue Earth on November 17. Other officers named include **Dr. H. E. Coulter,** Madelia, vice president, and **Dr. Herbert Boysen,** Madelia, secretary-treasurer.

* * *

Main speaker at the annual meeting of the Southern Minnesota Vegetable Growers Association in Albert Lea on November 29 was **Dr. Charles W. Mayo,** Rochester. The title of his address was "A Forward Look Toward Peace."

* * *

Dr. P. C. Hedenstrom has been elected president of the medical staff of Weiner Memorial Hospital at Marshall. Named as vice president of the staff was **Dr. T. C. Kreuzer,** and as secretary-treasurer, **Dr. J. E. Murphy.**

* * *

Dr. George M. Higgins, Rochester, senior consultant in the section of anatomy at the Mayo Clinic, retired on December 31. Dr. Higgins, who joined the Mayo Clinic in 1924, has published more than 200 original studies, primarily in fields of experimental biology.

* * *

Dr. Charles A. Corse, Kelliher, celebrated his eighty-second birthday anniversary on December 10. Dr. Corse began the practice of medicine in Verndale in 1897. For the past forty years, he has lived at Kelliher. He retired from active practice in 1941.

* * *

At the annual meeting of the Minnesota Obstetrical and Gynecological Society in Saint Paul recently, **Dr. R. F. Sturley,** Saint Paul, was elected president. Other new officers of the group include **Dr. Frederick Schade,** Worthington, vice president, and **Dr. E. A. Banner,** Rochester, secretary-treasurer.

* * *

Principal speaker at a meeting of the Lions Club in Crookston on November 14 was **Dr. C. L. Oppegaard** of Crookston, who gave an illustrated talk on a recent trip he made through Mexico.

* * *

Dr. M. J. Schirber, Grand Rapids, was moderator of a panel discussion on "The Place of the Hospital in the Community" at a meeting of the Tenth District Nurses Association at Grand Rapids on November 14.

* * *

Mahnomen lost both of its physicians in mid-December. **Dr. K. W. Covey,** who has practiced at Mahnomen for eleven years, announced last summer that he had accepted a residency in orthopedics at the Mayo Clinic, Rochester, beginning January 1. He closed his office in Mahnomen on December 17. **Dr. J. M. Gacusana,** who has practiced at Mahnomen since 1953, closed his office on December 15 and moved to Akron, Iowa. Dr. Gacusana stated that his decision to leave was influenced by the belief that "I cannot do justice to a medical practice without hospital facilities"—doubtless referring to a decision of the Sisters of St. Benedict to close St. Anthony's Hospital at Mahnomen on December 1.

* * *

Dr. and Mrs. P. R. Lipscomb, Rochester, returned late in November from a three and one-half week trip to Hawaii, during which Dr. Lipscomb was a guest speaker at a meeting of the Western Orthopedic Association.

* * *

Dr. S. J. Raetz, Maple Lake, discussed the diagnosis of cancer when he appeared as the principal speaker at a meeting of the Lions Club at Maple Lake in mid-November.

Dr. John A. Jensen was married to Gloria Natalie Baalson at the Valley Grove Lutheran Church at Nerstrand on November 5. Dr. Jensen is a member of the staff of the Crookston Clinic, Crookston.

* * *

Dr. Nellie O. Barsness, Saint Paul, has been named "Medical Woman of the Year" by the Minnesota branch of the American Medical Women's Association. Dr. Barsness, who specializes in ophthalmology and otolaryngology, has practiced medicine since 1902.

* * *

Principal speaker at a meeting of the Business and Professional Women's Club in Hutchinson recently was **Dr. C. G. Sheppard,** health officer at Hutchinson. He spoke on the subject, "Public Health."

* * *

Dr. David A. Sher, Virginia, was elected president of the Range Medical Society at a late fall meeting of the organization. Elected secretary-treasurer of the group was **Dr. D. J. Richter,** also of Virginia.

* * *

Dr. Ezra V. Bridge, superintendent and medical director of Mineral Springs Sanatorium, Cannon Falls, has been elected a trustee of the Upper Midwest Hospital Conference as a representative of the Minnesota Hospital Association.

* * *

The role of nursing in connection with mental health was the subject of a talk given by **Dr. Dale Cameron,** medical director of the Minnesota Department of Public Welfare, at a meeting of the Saint Paul District Nurses Association in Saint Paul in mid-November.

* * *

At a meeting of the Association of Fellows of the Mayo Foundation in Rochester on December 2, **Dr. Thomas E. Lynn,** a fellow in surgery from Dubuque, Iowa, was elected president to replace **Dr. Edward J. Sanders** of Omaha, Nebraska. Elected vice president was **Dr. Robert G. Stevens** from Wellsboro, Pennsylvania. **Dr. Frank M. Pearce,** from Ballinger, Texas, was named secretary, and **Dr. Louis B. Matthews** of Jackson, Tennessee, was elected treasurer.

* * *

Dr. Troy Rollins spoke on "Medical Work Among the Indians in Northern Minnesota" at a meeting of the Sixth District Nurses Association at the Rochester State Hospital on November 14.

* * *

Physicians held the spotlight at the Duluth Industrial Safety School Conference in Duluth on December 14. General speaker for the conference was **Dr. Charles W. Mayo,** Rochester, who spoke on "Living Safely." Section speakers at the conference included **Dr. John E. Power, Jr., Dr. John Peterson, Dr. William Klein** and **Dr. Frank J. Hirschboeck,** all of Duluth, and **Dr. Joseph Bloom,** Silver Bay. The safety school, which was open to the public, was sponsored by the Duluth Chamber of Commerce industrial safety committee.

* * *

Dr. Waltman Walters, head of a section of surgery in the Mayo Clinic and professor of surgery in the Mayo Foundation, has been advanced to the grade of rear

WE CORDIALLY INVITE YOUR INQUIRY for application for membership which affords protection against loss of income from accident and sickness (accidental death, too) as well as benefits for hospital expenses for you and all your eligible dependents.

P H A
OMAHA
P C A
OMAHA

the Emblems of RELIABLE PROTECTION

SINCE 1902

ALL PREMIUMS COME FROM

PHYSICIANS
SURGEONS
DENTISTS

ALL BENEFITS GO TO

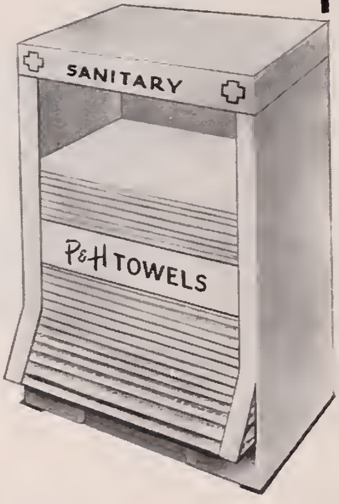
$4,500,000 ASSETS
$22,500,000 PAID FOR BENEFITS

PHYSICIANS CASUALTY
AND
HEALTH ASSOCIATIONS
OMAHA 2, NEBRASKA

P&H Super Absorbent TREATMENT TOWELS

- ✶ Lint Free
- ✶ Economical
- ✶ Sanitary
- ✶ Super Absorbent
- ✶ Superb Wet Strength
- ✶ Pure White

Not like ordinary treatment towels because they are of 3-ply construction and Melamine plastic treated for wet strength. In addition, they are super absorbent, lint free and sanitary. Can be autoclaved and used for sterile drapes. 14 x 18¼ inch size . . . pure snowy white and packed 500 to the case.



NEW DISPENSER

We are offering to you a beautiful white dispenser (pictured above) at no extra cost with the purchase of 5 cases or more. For complete details and prices write for information . . . Towels MM-156a

Physicians & Hospitals Supply Co.
1400 Harmon Place Minneapolis 3, Minn.

admiral in the U. S. Naval Reserve. He has been a member of the reserve since 1936.

* * *

Dr. Harry B. Zimmermann, retired chief of the medical staff of Miller Hospital, Saint Paul, was honored by 100 of his colleagues at a gathering in Saint Paul on November 18. A memorial plaque that will be mounted on the new Harry B. Zimmermann wing of Miller Hospital was unveiled at the meeting, and Dr. Zimmermann was presented with a silver plate. Speakers included **Dr. Frederic Foley, Dr. N. Logan Leven** and **Dr. Owen Wangensteen.** Dr. Zimmermann, who has been in practice for forty-five years, was chief of staff at Miller Hospital from 1941 to 1949.

* * *

Dr. William Sawyer Eisenstadt, Minneapolis, presented a paper entitled "Osteoporosis and Compression Fractures from Prolonged Cortisone and Corticotropin Therapy" at the second International Congress of Allergy in Rio de Janeiro, Brazil, November 6 to 13. Co-author of the paper was **Dr. Ephraim B. Cohen**, Minneapolis.

* * *

Dr. Albert Faulconer, Rochester, was elected a member of the board of directors of the American Board of Anesthesiology at a meeting in New York this past fall. He succeeds **Dr. John S. Lundy**, Rochester, who vacated the office after serving for seventeen years.

* * *

Dr. Robert W. Huber, Taylors Falls, has become a member of the Braham Community Hospital staff, serving as radiologist for the hospital two days per week.

NEW LOCATIONS

Dr. N. E. Fidelman has opened offices for the practice of medicine at Foley. He previously practiced there for four years before leaving for military service in 1953.

* * *

Dr. Willard H. Peterson has joined the staff of the medical department of Geo. A. Hormel & Co., Austin. The department has two other full-time physicians, **Dr. Tracy Barber** and **Dr. Donald O. Osborn.** Dr. Peterson had previously practiced at Spring Valley since 1950.

MINNESOTA BLUE SHIELD-BLUE CROSS

In comparing the Blue Shield statistical data for the month of October, 1955, with those of the same month in 1954, and the first ten months of 1955 with the same period of 1954, increases are apparent in the amount paid for claims by Blue Shield, in the number of services for which Blue Shield provided payment, and in enrollment of participant subscribers.

During the month of October, 1955, Blue Shield provided payments in the amount of $504,988 for doctors' services rendered participant subscribers. This figure represents an increase of $87,839 over the amount of $417,149 which was paid by Blue Shield in October of 1954, an increase of 21 per cent.

From January 1 through October 31, 1955, Blue Shield provided payments in the amount of $4,757,876 for services rendered Blue Shield subscribers, or $650,779 more than was paid during the same period in 1954. During the first ten months of 1954, Blue Shield paid $4,107,097 for services rendered participant subscribers. These figures represent an increase of approximately 15 per cent in the amount paid by Blue Shield for care of subscribers during the first ten months of 1955 as compared with the amount paid during the same period of 1954. The Blue Shield claims cost for the first ten months of 1955 is only $212,355 less than the amount paid during the entire year of 1954, when Blue Shield paid $4,970,231 for care of subscribers.

The number of doctors' services for which Blue Shield provided payments during the first ten months of 1955 is 165,536. This figure is 25,419 greater than the number of services paid by Blue Shield during the first ten months of 1954, representing an increase, percentagewise, of over 18 per cent.

In the ten-month period from January 1 through October 31, 1955, Blue Shield enrollment increased from 670,757 subscribers to 717,097 subscribers, representing a ten-month enrollment increase of 46,340 participant subscribers.

During the month of October, 1955, 84,244.8 days of hospital care were provided for 13,931 Minnesota Blue Cross participant subscribers. Compared to October, 1954, this represented an increase of 951 cases and 4,526.2 days of hospital care. There were several factors contributing to this increase. As of October, 1955, there were 384,721 Blue Cross contracts in effect compared to 377,747 as of October, 1954. There was a noticeable increase in certain types of cases. Digestive diseases showed an increase of 233 cases representing 1,071.0 days of patient care. Accident cases showed an increase of 221 cases, representing 1,563.8 days of patient care. Genito-urinary diseases showed an increase of 155 cases representing 240.2 days of patient care. Respiratory diseases showed an increase of 148 cases representing 645.5 days of patient care.

As of October 31, 1955, Blue Cross provided 850,282.6 days of hospital care for 138,880 subscribers compared to 831,496.8 days for 138,582 subscribers for the same ten months period in 1954 . . . or an increase of 298 cases and 18,785.8 days of patient care.

One of the contributing factors to the increased average of hospital days per case is the decrease in respiratory illnesses . . . primarily tonsillectomies.

There was also a decrease in the number of medical respiratory illnesses . . . 9,468 cases paid during the first ten months of 1955 compared to 10,372 cases paid during the same period in 1954.

The average length of hospital stay for obstetrical and medical care remained at 4.8 days and 6.4 days per case, respectively. The average stay for surgical care increased from 6.0 to 6.4 days . . . thus the effect of the decrease in number of tonsillectomies.

It is interesting to note that Blue Cross benefits for digestive diseases approximated $3,000,000 during the first ten months of 1955; obstetrical benefits exceeded $2,600,000; benefits provided for circulatory diseases nearly $2,000,000; benefits for genito-urinary diseases exceeded $1,600,000.

CAL-ZO
. . . still the
best all-purpose
DRESSING OINTMENT

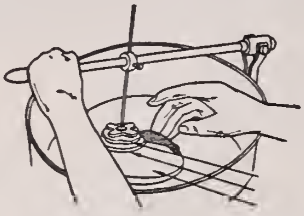
CAL-ZO
CALZO DRESSING OINTMENT
ULMER PHARMACAL COMPANY

CAL-ZO, originally prepared as the most suitable dressing ointment for pressure-sponge ambulatory treatment of varicose ulcers, continues as the ointment of choice for dressings of every nature. CAL-ZO is ideal whenever calamine and zinc oxide are indicated.
CAL-ZO provides a semi-fluid cushion at body temperature thus protecting lesions under treatment. Contact between gauze threads and seeping surfaces is prevented. Non-caking, it will not interfere with the healing lesion. CAL-ZO, because of its special base, will not soak into dressing at body temperatures. Easy to apply, CAL-ZO is the choice of the clinician when all-purpose dressing ointments are considered. Available in 1 oz. or 1¼ lb. jars. MM-156.

ULMER

ULMER PHARMACAL COMPANY
1400 Harmon Place Minneapolis, Minn.

UNUSUAL LENS GRINDING



CATARACT, MYO-THIN

and other difficult and complicated lenses are ground to extreme thinness and accuracy by our expert workmen.

ARTHUR F. WILLIAMS

SAINT PAUL
MINNESOTA

RADIUM

(Including Radium Applicators)
FOR ALL MEDICAL PURPOSES
Est. 1919

Quincy X-Ray and Radium Laboratories

(Owned and Directed by a Physician-Radiologist)

HAROLD SWANBERG, B.S., M.D.
Director

W. C. U. Bldg. Quincy, Illinois

GLYCAMINE®
TABLETS

For Peptic Ulcers and Hyperacidity

Available All Drug Stores

Distributed by
DALCO PHARMACAL CO.
Minneapolis, Minnesota

GYNECOLOGIC CYTOLOGY SERVICE

Interpretation of Cervico-Vaginal, Etc. (Papanicolaou) Smears for the Diagnosis of Carcinoma

Kits (Slides, Spatulas, Fixative and Mailing Containers)
and
Instructions for Taking and Mailing Smears furnished on request

M. WM. RUBENSTEIN, M.D.
GYNE-CYTOLOGY LABORATORY
104 S. MICHIGAN AVE. CHICAGO 3, ILL.

Book Reviews

Books listed here become the property of the Ramsey, Hennepin and St. Louis County Medical Libraries when reviewed. Members, however, are urged to write reviews of any or every recent book which may be of interest to physicians.

SHOULD THE PATIENT KNOW THE TRUTH? A Response of Physicians, Nurses, Clergymen, Lawyers. Edited by Samuel Standard, M.D., and Helmuth Nathan, M.D. 160 pages. Price, $3.00. New York: Springer Publishing Co., Inc., 1955.

After reading this book, my conclusion is that any patient of mature age should know the truth, if he or she asks for it.

There are spiritual and material values that are their responsibility. The contentment that comes from meeting these responsibilities far exceeds the worry of uncertainty. Everyone knows he has to die.

WM. R. BAGLEY, M.D.

CLINICAL DISORDERS OF HYDRATION AND ACID-BASE EQUILIBRIUM. By Louis G. Welt. 262 pages. Price, $6.00. Boston: Little, Brown & Company, 1955.

This is a praiseworthy book. In concise and orderly form, the author presents a comprehensive and stimulating review of his subject. The first part of the book is devoted to physiologic considerations, including a discussion of volumes and composition of body fluids, the dynamics of body water and electrolytes, acid-base relationships, renal physiology, and a brief but excellent chapter describing the consequences of expansion and contraction of the body fluids. Part two is devoted to clinical considerations, including a discussion of maintenance requirements, the use of parenteral fluids, dehydration, acid-base imbalance, edema, and acute renal insufficiency.

The book is well written and the diagrams are simple and pointed. The conciseness and clarity of this monograph is clearly dependent upon the author's unique approach. Rather than discuss in detail the various diseases which cause fluid and electrolyte disorders, Doctor Welt has considered the subject as it relates to homeostasis of body fluids in all circumstances, as regards volume, tonicity, composition, and pH. Thus, using fundamental principles and ideas acquired by a careful study of this book, the reader is able to evaluate and treat properly almost any disorder of fluid and electrolyte metabolism.

The reviewer does not hesitate to recommend a careful reading of this book by teachers and practitioners of medicine and surgery, as well as by undergraduate students.

ROBERT J. GOLDISH, M.D.

Classified Advertising

Replies to advertisements with key numbers should be mailed in care of Minnesota Medicine, *2642 University Avenue, Saint Paul 14, Minnesota.*

WANTED—Obstetrician and pediatrician for new Minneapolis group. Opportunity unsurpassed. Must apply at once. Address E-500, care Minnesota Medicine.

WANTED—Young General Practitioner, also young Internist to join small group consisting of Pediatrician, General Practitioner and General Surgeon in Minneapolis. Building is entirely new and designed for group practice. Address E-504, care Minnesota Medicine.

WANTED—Replacement of general practitioner entering service. Prosperous southern Minnesota farming area, 18 miles from hospital. Salary open with opportunity for association on return. Address E-506, care Minnesota Medicine.

VACANCIES—Positions available for clinical directors, Boarded or Board-eligible, in the Mental Hospital System of the State of Minnesota, $799-879 per month. One tuberculosis specialist interested in psychiatry, $774-854 per month. Two psychiatrist positions $699-779 per month. Two physicians $626-696 per month. Direct reply to Dale C. Cameron, M.D., Medical Director, State Department of Public Welfare, 117 University Avenue, Saint Paul 1, Minnesota, giving full information about training and experience.

WANTED—Locum tenens for general practice February and/or March, 1956. General hospital. Write E-498, care of Minnesota Medicine.

LOCATION AVAILABLE—Established medical location in Appleton, Wisconsin. Uptown business district, over prescription drug store. Six-room suite, large enough for two doctors. Will completely remodel. Rental $75.00 per month. Write or phone collect: B. E. Schwandt, Schlintz Drug Store, Appleton, Wisconsin. Phone 3-5645.

WANTED—Associate in general practice. City of 4,000 located 125 miles from Twin Cities in lake region. Good hospital, new. Early partnership. Address E-507, care Minnesota Medicine.

POSITION WANTED—Technician 16 years' experience, Laboratory and X-Ray, wants position doctor's office or clinic near Twin Cities. Can do typing, bookkeeping. Address E-509, care Minnesota Medicine.

WANTED—Board-certified or board-eligible ophthalmologist. Group of thirteen doctors in small midwest community. Liberal starting salary and partnership after one year. Address E-510, care Minnesota Medicine.

DESIRE POSITION with general practitioner(s) for six months beginning July, 1956. Frank R. Williams, M.D., Presbyterian Hospital, Chicago 12, Illinois.

PHYSICIAN NEEDED—Three rooms in new building available immediately. Reception room shared with dentist. Located at 2602 West Seventh Street, Saint Paul. No physician in area. Write D. Corte, 1800 Wordsworth, Saint Paul 16, Minnesota. Telephone MI 8-3766.

HOUSE STAFF APPOINTMENTS, one or two years, for American graduated licensed or with reciprocity in Minnesota. Must have completed an approved internship. Voluntary hospital with top medical staff; opportunity for best experience with Board-certified men in surgery, medicine, obstetrics-gynecology, and pediatrics; strong situation for physician preparing for general practice. Liberal salary arrangement. Apply: Administrator, Abbott Hospital, Minneapolis.

DOCTOR'S OFFICE AVAILABLE—Located in civic center of fast-growing Minneapolis suburb. Approximately 700 square feet; more, if needed. Dentist in same building. First time offered. We wager it will be the last. Call Mr. King. SOuth 1-8651.

FOR SALE—Large Minnesota EENT practice (mostly eye), long established, big territory, little competition. Reasonable. Your own terms. Retiring. Address E-503, care Minnesota Medicine.

DOCTOR OR DENTIST—Beautiful suite in South Minneapolis. Very modern. Six months free rent. Then option of lease at very reasonable rent. Wm. L. Cochrane, 4101 - 42nd Avenue South, Minneapolis, Minnesota. Telephone Ro 9-8758.

FOR RENT—Established medical suite, ground floor, modern air-conditioned building; 1100 square feet plus reception room. Best Minneapolis North Side location. Write Dr. W. P. Marxen, 2014 Emerson Avenue North, Minneapolis 11, Minnesota. Telephone CHerry 5306.

FOR RENT—Highland Shopping Area, equipped office available, full or part time. Share with surgeon and dentist. Excellent for general practice, obstetrics, pediatrics. H. Schwyzer, M.D., 2069 Ford Parkway, Saint Paul. Telephone: MI 8-4832 or CA 4-7416.

ATTENTION DENTISTS AND DOCTORS—Modern space available for dentists' and doctors' offices. A location where several sets of doctors and dentists have been long established and then built their own clinics. A money maker. Above Kisch's Food Market. Plenty of auto parking space. Apply 637 Stryker Avenue, Saint Paul, Minnesota.

FOR RENT—Medical Building in Hillcrest Shopping Center now completed. Two-thirds of Medical Offices occupied. Three suites still available. Building modernly equipped with convenient facilities, air-conditioning, ample parking and centrally located in Northwest's fastest growing Center. Ten thousand patrons within walking distance. Approximately 75,000 residents serviced by Hillcrest Center. Call or write Hillcrest Development, 1457 University Avenue, Saint Paul, Minnesota. MI 5-5829.

FOR SALE—60 ma Westinghouse Shockproof X-ray. Tilting table and fluoroscopy tube and screen. $500 worth of accessories. Ideal machine for office use. First $1,000 takes it, cash or terms, f.o.b. Duluth. Address E-505, care Minnesota Medicine.

The Birches Sanitarium, Inc.

2391 Woodland Avenue
Duluth 3, Minnesota

A hospital for the care and treatment of Nervous and Mental disorders. Quiet, cheerful environment. Specially trained personnel. Recreational and occupational therapy.

Dr. L. R. Gowan, M.D., M.S., Medical Director

Index to Advertisers

Abbott Laboratories	A-20, A-21
Aloe, A. S., Co.	A-26
American Meat Institute	A-5
American National Bank of St. Paul	Cover III
Anderson, C. F., Co., Inc.	A-28
Arlington-Funk Laboratories, Division of U. S. Vitamin Corporation	A-18, A-19
Ayerst (Premarin)	A-24
Bayer Co., The	A-6
Benson Optical Co.	A-16
Birches Sanitarium, Inc.	A-40
Brown & Day, Inc.	A-26
Buchstein-Medcalf Co.	Cover III
Burroughs Wellcome & Co.	A-4
Caswell-Ross Agency	22-A
Chicago Medical Society	22-D
Ciba	A-24
Classified Advertising	A-39
Cook County Graduate School of Medicine	A-26
Crestview Hospital	A-16
Dalco Pharmacal Co.	A-38
Danielson Medical Arts Pharmacy, Inc.	A-40
Druggists Mutual Insurance Co.	A-40
Foot-so-Port Shoe Co.	Cover III
Gyne-Cytology Laboratory	A-38
Hazelden Foundation	A-22
Hoffmann-La Roche	Facing A-16
Homewood Hospital	Cover III
Juran & Moody, Inc.	A-8
Knox, Chas. B., Gelatine Co.	A-11
Lakeside Laboratories	A-27
Lederle Laboratories	22-B, 22-C
Lilly, Eli, & Co.	Cover I, A-32
Mayo Clinic—Clinical Reviews	A-22
Mead Johnson & Co.	Cover IV
Medical Protective Co.	A-28
Parke, Davis & Co.	Cover II, A-1
Pfizer Laboratories, Division of Chas. Pfizer & Co.	A-13, A-17, A-29
Physicians Casualty & Health Associations	A-35
Physicians & Hospitals Supply Co.	A-36
Professional Credit Protective Bureau	A-14
Quincy X-Ray and Radium Laboratories	A-38
Radium Rental Service	Cover III
St. Croixdale Sanitarium	A-28
Schering Corporation	A-15, A-30, A-31
Searle, G. D., & Co.	A-33
Sharp & Dohme	A-25
Squibb	A-10
Tidy House Products Co.	A-7
Ulmer Pharmacal Company	A-37
Upjohn	A-23, 22-D
U. S. Vitamin Corporation	A-18, A-19
Viceroy Cigarettes	A-12
Williams, Arthur F.	A-38
Winthrop Laboratories	A-9

DANIELSON MEDICAL ARTS PHARMACY, INC.

10-14 Arcade, Medical Arts Building
825 Nicollet Avenue—Two Entrances—78 South Ninth Street
MINNEAPOLIS

PHONES:
FEderal 3-3317
FEderal 3-3318

HOURS:
WEEK DAYS—8 to 7
SUN. & HOL.—10 to 1

Insurance at a Saving

Druggists' Mutual Insurance Company
OF IOWA, ALGONA, IOWA

Fire - Tornado - Automobile Insurance

Prompt Loss Service

MINNESOTA REPRESENTATIVE—S. E. STRUBLE, WYOMING, MINN.

RADIUM RENTAL SERVICE
4340 CEDARWOOD ROAD
MINNEAPOLIS 5, MINNESOTA
TEL. FE 3-5297

Radium element prepared in type of applicator requested

ORDER BY TELEPHONE OR MAIL
PRICES ON REQUEST

SKILL AND CARE!

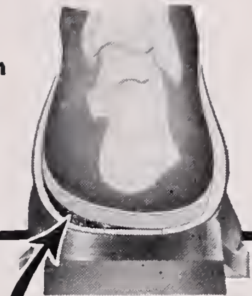
Combine with quality materials in all Buchstein-Medcalf orthopedic appliances. Our workmanship and scientific design conform to the most exacting professional specifications. Accepted and appreciated by physicians and their patients for more than 45 years.

ARTIFICIAL LIMBS, TRUSSES,
ORTHOPEDIC APPLIANCES,
SUPPORTERS, ELASTIC HOSIERY

Prompt, painstaking service

Buchstein-Medcalf Co.
223 So. 6th St. Minneapolis 2, Minn.

Foot-so-Port Shoe Construction and its Relation to Weight Distribution



- Insole extension and wedge at inner corner of heel where support is most needed.
- Special Supreme rubber heels are longer than most anatomic heels and maintain the appearance of normal shoes.
- The patented arch support construction is guaranteed not to break down.
- Innersoles are guaranteed not to crock, curl, or collapse. Insulated by a special layer of Texon which also cushions firmly and uniformly.
- Foot-so-Port lasts were designed and the shoe construction engineered with orthopedic advice.

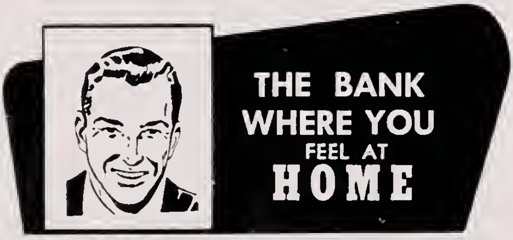
NOW AVAILABLE! Men's conductive shoes. N.B.F.U. specifications. For surgeons and operating room personnel.

- By a special process, using plastic positive casts of feet, we make more custom shoes for polio, club feet and all types of abnormal feet than any other manufacturer.

Write for details or contact your local ***FOOT-SO-PORT*** *Shoe Agency. Refer to your Classified Directory*

Foot-so-Port Shoe Company, Oconomowoc, Wis.

Invest In United States Government Bonds



the AMERICAN
NATIONAL BANK OF SAINT PAUL
MEMBER FEDERAL DEPOSIT INSURANCE CORPORATION

HOMEWOOD HOSPITAL is one of the Northwest's outstanding hospitals for the treatment of Nervous Disorders equipped with all the essentials for rendering high-grade service to patient and physician.

*Operated in Connection with
Glenwood Hills Hospitals*

HOMEWOOD HOSPITAL
Corner Penn and Plymouth Avenues North
Minneapolis Minnesota

Sick patients

need food for therapy

Sustagen

Therapeutic Food for
Complete Nourishment

THAT MAN MUST EAT to remain well is a concept as old as medicine. But only recently has it been established (1) that nutritional needs are increased in illness; (2) that food sufficient to meet these needs is well utilized, and (3) that therapeutic nutrition prevents many of the debilitating effects of disease and injury.

Unfortunately, because of the anorexia accompanying illness, effective nutritional therapy requires added care on the part of the physician. Food comes from familiar kitchens and lacks the impressive aura of more dramatic therapeutic agents. Thus it is often difficult to convince the patient that food, too, is therapeutic —that although drugs may arrest disease only food can repair the ravages of disease.

Whatever the nutritional problem—whether caused by anorexia, mechanical difficulty in eating or limitation of gastric capacity or tolerance—only an assured food intake will solve it. The use of Sustagen, a food formulated for therapeutic nourishment, will overcome many difficulties in the therapeutic feeding of sick patients. A foundation for therapy thus may be established.

The development of Sustagen exemplifies the continuous effort of Mead Johnson & Company to provide the medical profession with products basic to the management of illness and the restoration of health.

Sustagen® is the only single food which contains all known nutritional essentials: protein, carbohydrate, fat, vitamins and minerals. It may be given by mouth or tube as the only source of food or to fortify the diet in brief or prolonged illness.

Sustagen

repairs tissue
restores appetite
overcomes asthenia

in

cirrhosis
peptic ulcer
geriatrics
infections
trauma
chronic disease

MEAD

SYMBOL OF SERVICE IN MEDICINE

MEAD JOHNSON & COMPANY, EVANSVILLE 21, INDIANA, U.S.A.

MSMA Annual Meeting—Rochester, May 21-23, 1956

Minnesota MEDICINE

PUBLISHED MONTHLY BY THE MINNESOTA STATE MEDICAL ASSOCIATION

Volume 39 FEBRUARY, 1956 Number 2

Printed in U.S.A. (Table of Contents—Pages A-2 and A-3) 40c a copy—$3.00 a year

COLLEGE OF PHYSICIANS
LIBRARY
FEB 20 1956
OF PHILADELPHIA

Tonsillitis, pharyngitis quickly yield to

ILOTYCIN

(Erythromycin, Lilly)

Temperature rapidly returns to normal; swelling and soreness readily subside. Notably *safe* and well tolerated.

dosage: Usually, 250 mg. q. 6 h. Children, 5 mg. per pound of body weight q. 6 h.

Lilly

532200

YOU MEAN YOU HAD TO PAY TWENTY-FIVE DOLLARS FOR THOSE NEW MEDICINES?
YES... BUT THEY SAVED $900 AND MY HUSBAND'S LIFE!

YEARS AGO when the physician fought to bring a patient through a siege of pneumonia there was little he could do but help conserve the patient's strength, make him comfortable . . . and hope for the best.

In fact, the doctor sadly signed death certificates for 33 out of every 100 pneumonia patients he treated. For those who survived, recovery was slow and expenses were high. The cost of an average case was about $1,000, including three or four weeks' time lost away from work.

Happily, this grim picture has changed. Under the onslaught of sulfa drugs . . . *and now the antibiotics* . . . pneumonia has steadily lost ground. Now, uncomplicated cases clear up in four to five days. And instead of losing 33 out of every 100 cases, the doctor saves all but a very few.

Just as striking as the cut in deaths and disability is the cut in the *cost* of *curing* pneumonia. More and more patients can now be cared for at home. As a result, the average case of pneumonia may cost no more than $100 . . . including loss of income, the doctor's visits and the "expensive" new medicines!

Today, more than ever before, an investment in prompt and proper medical care may well represent one of the biggest bargains of your life.

Copyright 1956—Parke, Davis & Company

PARKE, DAVIS & COMPANY
Research and Manufacturing Laboratories Detroit 32, Michigan

Makers of medicines since 1866

There are few subjects on which the general public is more uninformed (or perhaps *mis*informed) than the cost of modern medical care.

People have always grumbled about medical bills—and they probably always will, to some extent. The trouble is they tend to see medical expense as a part of sickness—something that certainly gives them no pleasure—rather than the price of enjoying good health.

But the real economics of the situation—what the patient gets for what he pays—proves that today's medical bill usually turns out to be one of the really big bargains of his life.

The latest Parke-Davis advertisement, reproduced here, cites the amazing decline in the cost of curing pneumonia to illustrate the remarkable value represented by your patient's investment in prompt and proper medical care.

This message will reach an audience of millions of readers in mass-circulation magazines such as LIFE and the SATURDAY EVENING POST. Reprints, in small folder form, are promptly available to physicians on request.

PARKE, DAVIS & COMPANY *Detroit 32, Michigan*

Volume 39

Minnesota

Contents for

SCIENTIFIC ARTICLES

ORIGINAL CONTRIBUTIONS

Amebiasis
J. Arnold Bargen, M.D., Rochester, Minnesota........... 69

Hormonal Treatment of Advanced Breast Cancer
E. A. Regnier, M.D., Minneapolis, Minnesota........... 76

Problems in the Clinical Diagnosis and Classification of Ventricular Hypertrophy in Adults
II. Right Ventricular Hypertrophy
Ben Sommers, M.D., Saint Paul, Minnesota............... 83

The Use of Blood and Plasma Expanders during the Third Trimester of Pregnancy
Thomas H. Seldon, M.D., Rochester, Minnesota.......... 87

Why Not Pack the Postpartum Uterus?
Jack R. Pierce, M.D., Virginia, Minnesota, and *Edward G. Winkler, M.D.,* Buffalo, New York........ 89

Oxygen Therapy in the Premature Infant as a Cause of Retrolental Fibroplasia
Robert W. Hollenhorst, M.D., Rochester, Minnesota.. 91

Massive Upper Gastrointestinal Bleeding
W. P. Eder, M.D., Minneapolis, Minnesota................. 94

CASE PRESENTATIONS

Hookworm Treatment of Polycythemia Vera
James Myhre, M.D., and *Franklin Wallace, Ph.D.,* Minneapolis, Minnesota 99

Eosinophilia in Malignant Disease
David G. Hanlon, M.D., Rochester, Minnesota........... 101

SEMINAR

The Systemic Mycoses
Matthew B. Divertie, M.D., Ch.B., and *Corrin H. Hodgson, M.D.,* Rochester, Minnesota...................... 103

CURRENT CARDIAC CONCEPTS

Smoking and the Cardiovascular System
Grace M. Roth, Ph.D., Rochester, Minnesota............. 111

CONTINUATION STUDIES

Genetic and Familial Aspects of Central Nervous Conditions in Children
Ray C. Anderson, Ph.D., M.D., Minneapolis, Minnesota 112

Official Journal of

Duluth Surgical Society
Minneapolis Academy of Medicine
Minneapolis Obstetrical and Gynecological Society
Minneapolis Surgical Society
Minnesota Academy of Medicine
Minnesota Society of Clinical Pathologists

Owner and Publisher

Published by MINNESOTA STATE MEDICAL ASSOCIATION
496 Lowry Medical Arts Building
St. Paul 2, Minnesota

Editing and Publishing Committee

E. M. Hammes, M.D.
Chairman, Saint Paul

F. M. Owens, Jr., M.D.
Saint Paul

T. A. Peppard, M.D.
Minneapolis

Henry Ulrich, M.D.
Minneapolis

Business Manager

R. R. Rosell
496 Lowry Medical Arts Building
St. Paul 2, Minnesota

GENERAL

Authors

Manuscripts should be addressed to Arthur H. Wells, M.D., Editor, 915 East First Street, Duluth 5, Minnesota. Telephone RA 7-6636 or JA 5-2319. Original papers prepared for publication solely in Minnesota Medicine will be considered by the Board of Editors providing they fulfill the following editorial standards. Manuscripts should be typed double spaced on white paper with at least 1-inch margins. The original (not a carbon copy) is requested. The title on the first page should be under six words if possible or divided into two parts. The author should give his highest degree, his institutional position or his relationship to a hospital or medical organization which he may be addressing. Pages should be numbered consecutively and the author's last name should appear at the top of each page after the first page.

Biographical references should appear on a separate sheet entitled "Bibliography." They should appear and be numbered consecutively in the order in which they first occur in the text (not alphabetically). Citations in the text require reference numbers if the author's or authors' names are not used or if there is more than one reference to the same author or group of authors. All references to author should appear in the Bibliography and no references should be included which are not in the text. The style and exact punctuation used in the J.A.M.A. references is requested. For a journal this is: *Author's last name, initial, initial.: title of paper. Abbreviated name of journal, volume number: page, year.* Book references should give author, title, edition number, city, publisher and year.

Illustrations (photographs, tables and graphs) should be submitted separately and not combined in the text. There should be a separate sheet entitled "Illustrations" which contains the various types of illustrations listed separately and numbered in the order

Medicine

Number 2

February, 1956

MISCELLANEOUS ARTICLES

EDITORIALS

The Written and the Spoken Word 115
Group Therapy 115
The Internship and Licensure 116
Research and the Practicing Physician 116
Medical Ethics in Routine Practice 118
Income Management 118
Banks and Investment Services 119
Sick Leave and the Taxpayer 120
New Look 120

PRESIDENT'S LETTER

Group Liability Insurance 121

MEDICAL ECONOMICS

State of the Union Message 122
Cost of Proposed Medical Research 123
Cancer Research May Benefit 123
Military Dependents' Health Insurance 124

REPORTS AND ANNOUNCEMENTS 124

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

Minneapolis Woman Sentenced on Abortion Charge 125

WOMAN'S AUXILIARY 125

IN MEMORIAM

Richard Charles Adams 126
Stephen Henry Baxter 126
Rolv Sigvard Hegge 126
Willard Samuel Howard 126

GENERAL INTEREST

Personal News A-34
New Locations A-37
Minnesota Blue Shield-Blue Cross A-37

BOOK REVIEWS A-40

CLASSIFIED ADVERTISING A-48

INDEX TO ADVERTISERS A-49

Minnesota Society of Internal Medicine
Minnesota State Medical Association
Minnesota Obstetric and Gynecologic Society
Minnesota Surgical Society
Northern Minnesota Medical Association
Southern Minnesota Medical Association

INFORMATION

in which they appear in the text. All photographs must be in black and white, clear cut, contrasting, and on glossy prints. Instructions for combining photographs are acceptable. Any number of illustrations over 4 are charged to the author. Combinations of photographs up to one-half page (6 x 4⅜ inches) count as 1 illustration.

Readers and Reviewers

The right is reserved to reject material submitted for reading or advertising columns. The views expressed in this journal do not necessarily represent those of the Minnesota State Medical Association or any of its constituents.

Advertisers and Subscribers

Classified advertising—10 cents a word; minimum charge $2.00; key number, 25c additional. Remittance should accompany order. Display advertising rates on request.

Annual Subscription—$3.00. Single Copies—$0.40. Foreign and Canadian—$3.50.

Communications concerning advertising and subscriptions should be addressed to Minnesota Medicine, 2642 University Avenue, Saint Paul 14, Minnesota. Telephone Midway 6-2641.

Copyright and Post Office Entry

Contents of Minnesota Medicine ©1956 by Minnesota State Medical Association.

Entered at the Post Office in Saint Paul as second class matter. Accepted for mailing at the special rate of postage provided for in Section 1103, Act of October 3, 1917, authorized July 13, 1918.

Board of Editors

Arthur H. Wells, M.D.
Editor-in-Chief, Duluth

Stuart W. Arhelger, M.D.
Minneapolis

John F. Briggs, M.D.
Saint Paul

Alex E. Brown, M.D.
Rochester

S. Francis Ceplecha, M.D.
Redwood Falls

Tague C. Chisholm, M.D.
Minneapolis

Robert B. Howard, M.D.
Minneapolis

Henry G. Moehring, M.D.
Duluth

Glenn J. Mouritsen, M.D.
Fergus Falls

Olive V. Seibert, B.A.
Saint Paul

George Stilwell, M.D
Rochester

Minnesota State Medical Association
1956

Officers

R. H. Wilson, M.D.	*President*	Winona
Gordon C. MacRae, M.D.	*First Vice President*	Duluth
Mancel T. Mitchell, M.D.	*Second Vice President*	Minneapolis
B. B. Souster, M.D.	*Secretary*	Saint Paul
W. H. Condit, M.D.	*Treasurer*	Minneapolis
C. G. Sheppard, M.D.	*Speaker, House of Delegates*	Hutchinson
H. M. Carryer, M.D.	*Vice Speaker, House of Delegates*	Rochester
R. R. Rosell	*Executive Secretary*	Saint Paul

Councilors

(Terms expire December 31 of year indicated)

First District

J. M. Stickney, M.D. (1956)	Rochester

Second District

R. C. Hunt, M.D. (1956)	Fairmont

Third District

P. E. Hermanson, M.D. (1958)	Hendricks

Fourth District

H. J. Nilson, M.D. (1957)	North Mankato

Fifth District

L. R. Critchfield, M.D. (1958)	Saint Paul

Sixth District

H. B. Sweetser, M.D. (1957)	Minneapolis

Seventh District

W. W. Will, M.D. (1958)	Bertha

Eighth District

C. L. Oppegaard, M.D. (1957) Chairman	Crookston

Ninth District

Clarence Jacobson, M.D. (1956)	Chisholm

House of Delegates, American Medical Association

Members

J. Arnold Bargen, M.D. (1956)	Rochester
O. J. Campbell, M.D. (1957)	Minneapolis
George Earl, M.D. (1957)	Saint Paul
F. J. Elias, M.D. (1956)	Duluth

Alternates

Paul C. Leck, M.D. (1956)	Austin
C. L. Oppegaard, M.D. (1957)	Crookston
E. M. Hammes, Sr., M.D. (1957)	Saint Paul
A. O. Swenson, M.D. (1956)	Duluth

Scientific Committees

ANESTHESIOLOGY

T. H. Seldon, M.D.	Rochester
Margaret C. Anderson, M.D.	Mankato
J. W. Baird, M.D.	Minneapolis
J. H. Crowley, M.D.	Saint Paul
R. C. Gaard, M.D.	Minneapolis
F. C. Jacobson, M.D.	Duluth
Robert C. Knutson, M.D.	Saint Paul
John E. Osborn, M.D.	Rochester

BLOOD AND BLOOD BANKS

J. S. Lundy, M.D.	Rochester
Paul F. Dwan, M.D.	Minneapolis
J. W. Edwards, M.D.	Saint Paul
E. V. Goltz, M.D.	Saint Paul
Wm. V. Knoll, M.D.	Brainerd
R. W. Koucky, M.D.	Minneapolis
Donald J. Nollett, M.D.	Hibbing
N. C. Plimpton, M.D.	Minneapolis
Howard M. Wikoff, M.D.	Crookston

CANCER

(Three-year appointment)

David P. Anderson, Jr., M.D. (1958)	Austin
P. F. Eckman, M.D. (1958)	Duluth
G. F. Hartnagel, M.D. (1956)	Red Wing
Paul Heise, M.D. (1958)	Winona
C. R. Hitchcock, M.D. (1956)	Minneapolis
N. K. Jensen, M.D. (1958)	Minneapolis
Leonard A. Lang, M.D. (1958)	Minneapolis
N. Logan Leven, M.D., (1956)	Saint Paul
T. B. Magath, M.D. (1956)	Rochester
F. M. Owens, Jr. M.D. (1958)	Saint Paul
D. E. Stewart, M.D. (1958)	Crookston

CHILD HEALTH

G. B. Logan, M.D.	Rochester
Eldon Berglund, M.D.	Minneapolis
T. C. Chisholm, M.D.	Minneapolis
J. J. Galligan, M.D.	Saint Paul
O. H. Jones, M.D.	Mankato

Charles W. Rogers, M.D.	Winona
A. B. Rosenfield, M.D.	Minneapolis
V. O. Wilson, M.D.	Rochester
Edward Zupanc, M.D.	Duluth

CONSERVATION OF HEARING

K. M. Simonton, M.D.	Rochester
L. R. Boies, M.D.	Minneapolis
John H. Cameron, M.D.	Crookston
C. E. Connor, M.D.	Saint Paul
J. B. Gaida, M.D.	St. Cloud
Anderson Hilding, M.D.	Duluth
Conrad J. Holmberg, M.D.	Minneapolis
J. Donald Sjoding, M.D.	Mankato

DIABETES

J. R. Meade, M.D.	Saint Paul
Moses Barron, M.D.	Minneapolis
J. J. Boehrer, M.D.	Minneapolis
J. J. Eustermann, M.D.	Mankato
D. R. Gillespie, M.D.	Saint Paul
Robert E. Hansen, M.D.	Hibbing
L. L. Merriman, M.D.	Duluth
E. H. Rynearson, M.D.	Rochester
R. V. Sherman, M.D.	Red Wing
Harvey E. Sisk, M.D.	St. Cloud

FIRST AID AND RED CROSS

J. S. Lundy, M.D.	Rochester
Elizabeth C. Bagley, M.D.	Duluth
C. F. Brigham, Jr., M.D.	St. Cloud
J. W. Edwards, M.D.	Saint Paul
B. A. Flesche, M.D.	Lake City
E. V. Goltz, M.D.	Saint Paul
D. L. Jacobs, M.D.	Willmar
J. J. Kolars, M.D.	Faribault
W. F. Nordman, M.D.	Mora
E. H. O'Phelan, M.D.	Minneapolis
J. C. Vezina, M.D.	Mapleton

FRACTURES

E. T. Evans, M.D.	Minneapolis
N. H. Baker, M.D.	Fergus Falls
W. H. Cole, M.D.	Saint Paul
Robert B. Engstrom, M.D.	Mankato
T. P. Groschupf, M.D.	Bemidji
V. P. Hauser, M.D.	Saint Paul
John C. Ivins, M.D.,	Rochester
W. J. McDonald, M.D.	Crookston
J. H. Moe, M.D.	Minneapolis
Harry B. Neel, M.D.	Albert Lea
M. J. Nydahl, M.D.	Minneapolis
A. B. Roehlke, M.D.	Elk River
W. A. Swedberg, M.D.	Duluth

GENERAL PRACTICE

H. E. Drill, M.D.	Hopkins
E. C. Bayley, M.D.	Lake City
Chas. C. Cooper, M.D.	Saint Paul
H. E. Coulter, M.D.	Madelia
Donald C. Deters, M.D.	Saint Paul
C. S. Donaldson, M.D.	St. Cloud
R. J. Eckman, M.D.	Duluth
W. E. Hart, M.D.	Monticello
H. P. Hinderaker, M.D.	Bird Island
Gerald Larson, M.D.	Cambridge
W. W. Rieke, M.D.	Wayzata

GERIATRICS AND CHRONIC ILLNESS

Leo A. Nash, M.D.	Saint Paul
C. A. Anderson, M.D.	Hector
R. H. Conley, M.D.	Mankato
John Leo Delmore, Jr., M.D.	Roseau
Albert J. Greenberg, M.D.	Minneapolis
O. M. Heiberg, M.D.	Worthington
John A. Lepak, M.D.	Saint Paul
Walter S. Neff, M.D.	Virginia

HEART

(Three-year appointment)

F. J. Hirschboeck, M.D. (1958)	Duluth
J. F. Borg, M.D. (1958)	Saint Paul
J. F. Briggs, M.D. (1956)	Saint Paul
Hendrik DeKruif, M.D. (1958)	Fergus Fall
Paul F. Dwan, M.D. (1958)	Minneapolis
C. N. Hensel, M.D. (1958)	Saint Paul
M. M. Hurwitz, M.D. (1956)	Saint Paul
R. O. Sather, M.D. (1958)	Crookston
H. L. Smith, M.D. (1958)	Rochester
Chester Thiem, M.D. (1956)	Mankato
D. W. Wheeler, M.D. (1958)	Duluth
Asher A. White, M.D. (1958)	Minneapolis

HISTORICAL

Robert Rosenthal, M.D.	Saint Paul
Richard Bardon, M.D.	Duluth
W. F. Braasch, M.D.	Rochester
L. H. Flancher, M.D.	Crookston
Carl Fritsche, M.D.	New Ulm
Walter H. Halloran, M.D.	Jackson
A. J. Lewis, M.D.	Henning
A. G. Liedloff, M.D.	Mankato
Thos. A. Peppard, M.D.	Minneapolis
A. M. Watson, M.D.	Royalton
W. E. Wilson, M.D.	Northfield

HOSPITALS AND MEDICAL EDUCATION

H. S. Diehl, M.D.	Minneapolis
T. E. Broadie, M.D.	Saint Paul
B. C. Ford, M.D.	Marshall
A. C. Kerkhof, M.D.	Minneapolis
Henry A. Korda, M.D.	Pelican Rapids
Arnold Larson, M.D.	Detroit Lakes
John P. Medelman, M.D.	Saint Paul
P. F. Meyer, M.D.	Faribault
H. J. Walder, M.D.	Duluth
E. E. Wollaeger, M.D.	Rochester
L. I. Younger, M.D.	Winona

INDUSTRIAL HEALTH

L. W. Foker, M.D.	Minneapolis
Tracy E. Barber, Jr., M.D.	Austin
John D. Barker, M.D.	Duluth
C. C. Bell, M.D.	Saint Paul
H. B. Clark, M.D.	St. Cloud
T. A. Lowe, M.D.	South Saint Paul
O. L. McHaffie, M.D.	Duluth
W. E. Park, M.D.	Minneapolis
John W. Raattama, M.D.	Nashwauk
Edward Schons, M.D.	Saint Paul
J. F. Shronts, M.D.	Minneapolis
H. H. Young, M.D.	Rochester

MATERNAL HEALTH

J. J. Swendson, M.D.	Saint Paul
P. N. Bray, M.D.	Duluth
J. F. DuBois, Jr., M.D.	Sauk Centre
John Faber, M.D.	Rochester
G. F. Hartnagel, M.D.	Red Wing
John A. Haugen, M.D.	Minneapolis
J. L. McKelvey, M.D.	Minneapolis
W. F. Mercil, M.D.	Crookston
Mancel T. Mitchell, M.D.	Minneapolis
Pat Rollins, M.D.	St. Charles
A. B. Rosenfield, M.D.	Minneapolis
E. C. Sargent, M.D.	Austin
F. L. Schade, M.D.	Worthington
A. O. Swenson, M.D.	Duluth

MEDICAL TESTIMONY

E. M. Hammes, Sr., M.D.	Saint Paul
Mark B. Coventry, M.D.	Rochester
A. J. Leemhuis, M.D.	Minneapolis
L. H. Rutledge, M.D.	Detroit Lakes
G. J. Strewler, M.D.	Duluth
W. G. Workman, M.D.	Tracy

MILITARY AFFAIRS

K. E. Johnson, M.D.	Duluth
E. G. Benjamin, M.D.	Minneapolis
Floyd M. Burns, M.D.	Milan
Julius E. Haes, M.D.	Mankato
N. H. Lufkin, M.D.	Minneapolis
Donald McCarthy, M.D.	Saint Paul
W. P. Ritchie, M.D.	Saint Paul
Joseph M. Ryan, M.D.	Saint Paul
John T. Smiley, M.D.	Minneapolis
A. K. Stratte, M.D.	Pine City
Bernard Street, M.D.	Northfield
J. H. Tillisch, M.D.	Rochester

NERVOUS AND MENTAL DISEASES

W. P. Gardner, M.D.	Saint Paul
Joe R. Brown, M.D.	Rochester
W. S. Chalgren, M.D.	Mankato
E. J. Engberg, M.D.	Faribault
J. E. T. Haavik, M.D.	Duluth
E. M. Hammes, Jr., M.D.	Saint Paul
H. B. Hannah, M.D.	Minneapolis
Hyman S. Lippman, M.D.	Saint Paul
Harold H. Noran, M.D.	Minneapolis
W. L. Patterson, M.D.	Fergus Falls
Paul Reed, M.D.	Virginia

OPHTHALMOLOGY

T. R. Fritsche, M.D.	New Ulm
A. F. Adair, Jr., M.D.	Saint Paul
H. W. Grant, M.D.	Saint Paul
E. W. Hansen, M.D.	Minneapolis
Hobart C. Johnson, M.D.	Mankato
F. N. Knapp, M.D.	Duluth
George L. Loomis, M.D.	Winona
C. W. Rucker, M.D.	Rochester
T. R. Schweiger, M.D.	Hibbing
C. E. Stanford, M.D.	Minneapolis
W. T. Wenner, M.D.	St. Cloud

PUBLIC HEALTH NURSING

M. McC. Fischer, M.D.	Duluth
C. F. Brigham, Jr., M.D.	St. Cloud
W. C. Chambers, M.D.	Blue Earth
Luther F. Davis, M.D.	Wadena
Helen L. Knudsen, M.D.	Minneapolis
C. E. Merkert, M.D.	Minneapolis
R. B. J. Schoch, M.D.	Saint Paul
Theodore W. Stransky, M.D.	Owatonna

SYPHILIS AND SOCIAL DISEASES

H. G. Irvine, M.D.	Minneapolis
L. A. Brunsting, M.D.	Rochester
John A. Butzer, M.D.	Mankato
W. E. Hatch, M.D.	Duluth
George W. Hauser, M.D.	Minneapolis
F. W. Lynch, M.D.	Saint Paul
H. E. Michelson, M.D.	Minneapolis
C. W. Moberg, M.D.	Detroit Lakes
J. F. Schmid, M.D.	Duluth

TUBERCULOSIS

J. F. Briggs, M.D.	Saint Paul
J. A. Myers, M.D., Vice Chairman	Minneapolis
R. N. Barr, M.D.	Minneapolis
Ezra V. Bridge, M.D.	Cannon Falls
F. F. Callahan, M.D.	Saint Paul
S. S. Cohen, M.D.	Oak Terrace
Dean S. Fleming, M.D.	Hopkins
G. A. Hedberg, M.D.	Nopeming
Corrin H. Hodgson, M.D.	Rochester
L. S. Jordan, M.D.	Granite Falls
E. A. Meyerding, M.D.	Saint Paul
W. E. Peterson, M.D.	Willmar
C. G. Sheppard, M.D.	Hutchinson
S. A. Slater, M.D.	Worthington
Lyle A. Tongen, M.D.	Saint Paul
W. H. Ude, M.D.	Minneapolis

VACCINATION AND IMMUNIZATION

R. N. Barr, M.D.	Minneapolis
E. E. Barrett, M.D.	Duluth
Luther Davis, M.D.	Wadena
L. E. Harris, M.D.	Rochester
C. O. Kohlbry, M.D.	Duluth
R. B. J. Schoch, M.D.	Saint Paul
C. S. Strathern, M.D.	St. Peter
R. L. Wilder, M.D.	Minneapolis

Non-Scientific Committees

EDITING AND PUBLISHING

E. M. Hammes, Sr., M.D.	Saint Paul
Frederick M. Owens, Jr., M.D.	Saint Paul
T. A. Peppard, M.D.	Minneapolis
H. L. Ulrich, M.D.	Minneapolis
A. H. Wells, M.D. *(Ex officio)*	Duluth

BOARD OF EDITORS

A. H. Wells, M.D., Editor	Duluth
Stuart W. Arhelger, M.D.	Minneapolis
John F. Briggs, M.D.	Saint Paul
S. F. Ceplecha, M.D.	Redwood Falls
Tague C. Chisholm, M.D.	Minneapolis
Robert B. Howard, M.D.	Minneapolis
Roland Drew Miller, M.D.	Rochester
Henry C. Moehring, M.D.	Duluth
Glenn J. Mouritsen, M.D.	Fergus Falls
Olive V. Seibert, B.A.	Saint Paul
George G. Stilwell, M.D.	Rochester
E. M. Hammes, Sr., M.D. *(Ex officio)*	Saint Paul

HOSPITALS AND PROFESSIONAL RELATIONS

C. Allen Good, M.D.	Rochester
F. W. Behmler, M.D.	Morris
W. C. Bernstein, M.D.	Saint Paul
W. T. Greenfield, M.D.	Cokato
Kano Ikeda, M.D.	Saint Paul
K. E. Latterell, M.D.	Duluth
Thomas Lowry, M.D.	Minneapolis

INSURANCE LIAISON COMMITTEE

Corrin H. Hodgson, M.D.	Rochester
R. P. Buckley, M.D.	Duluth
John Dordal, M.D.	Sacred Heart
P. W. Harrison, M.D.	Worthington
Robert McGandy, M.D.	Minneapolis
Horatio Van Cleve, M.D.	Austin
Clarence W. Walter, M.D.	Saint Paul

INTERPROFESSIONAL RELATIONS

M. J. Anderson, M.D.	Rochester
H. G. Bosland, M.D.	Willmar
K. R. Fawcett, M.D.	Duluth
M. I. Hauge, M.D.	Clarkfield
G. M. B. Hawley, M.D.	Red Wing
E. A. Heiberg, M.D.	Fergus Falls
Elmer Lippmann, M.D.	Hutchinson
J. C. Mankey, M.D.	Minneapolis
M. J. McKenna, M.D.	Grand Rapids
R. F. Sturley, M.D.	Saint Paul

MALPRACTICE INSURANCE

A. E. Ritt, M.D.	Saint Paul
Ernest R. Anderson, M.D.	Minneapolis
George W. Drexler, M.D.	Blue Earth
Owen McDonald, M.D.	Duluth
Harold E. Miller, M.D.	Minneapolis
M. E. Mosby, M.D.	Long Prairie
George E. Penn, M.D.	Mankato
L. F. Wasson, M.D.	Alexandria

MEDICAL ECONOMICS

George Earl, M.D., *General Chairman*	Saint Paul

Executive Committee

George Earl, M.D.	Saint Paul
F. J. Elias, M.D.	Duluth
W. H. Hengstler, M.D.	Saint Paul
Corrin H. Hodgson, M.D.	Rochester
C. E. Proshek, M.D.	Minneapolis
William Proffitt, M.D.	Minneapolis

Editorial Committee

George Earl, M.D.	Saint Paul
W. A. Merritt, M.D.	Rochester
W. L. Patterson, M.D.	Fergus Falls
H. F. R. Plass, M.D.	Minneapolis
A. H. Wells, M.D.	Duluth

Medical Advisory Committee

W. H. Hengstler, M.D.	Saint Paul
J. B. Beuning, M.D.	St. Cloud
Mark B. Coventry, M.D.	Rochester
P. G. E. Hoeper, M.D.	Mankato
D. C. MacKinnon, M.D.	Minneapolis
G. C. MacRae, M.D.	Duluth
Harvey Nelson, M.D.	Minneapolis

Medical Service

William Proffitt, M.D.	Minneapolis
F. S. Babb, M.D.	Saint Paul
C. M. Bagley, M.D.	Duluth
Tague C. Chisholm, M.D.	Minneapolis
Wm. M. Feigal, M.D.	Thief River Falls
Frank J. Heck, M.D.	Rochester
L. M. Hammar, M.D.	Mankato
B. G. Lannin, M.D.	Saint Paul
F. W. Lynch, M.D.	Saint Paul
R. A. Murray, M.D.	Hibbing
Harry B. Neel, M.D.	Albert Lea
James P. O'Keefe, M.D.	St. Cloud
H. F. R. Plass, M.D.	Minneapolis

State Health Relations

C. E. Proshek, M.D.	Minneapolis
R. W. Barr, M.D.	Montevideo
B. J. Bouquet, M.D.	Wabasha
John Earl, M.D.	Saint Paul
J. J. Eustermann, M.D.	Mankato
Fred N. Grose, M.D.	Clarissa
Raymond J. Jackman, M.D.	Rochester
Samuel N. Litman, M.D.	Duluth
C. N. McCloud, Jr., M.D.	Saint Paul
D. R. Mueller, M.D.	Bagley
R. H. Puumala, M.D.	Cloquet
Carl Simison, M.D.	Barnesville

MEDICAL ETHICS

Harry Klein, M.D.	Duluth
John E. Holt, M.D.	Saint Paul
T. J. Kinsella, M.D.	Minneapolis
George E. Penn, M.D.	Mankato
Harry M. Weber, M.D.	Rochester

MEMBERSHIP COMMITTEE

H. F. R. Plass, M.D.	Minneapolis
H. M. Carryer, M.D.	Rochester
John W. Gridley, M.D.	Arlington
Carl Lundell, M.D.	Granite Falls
H. R. Thysell, M.D.	Crookston
M. O. Wallace, M.D.	Duluth
B. A. Weis, M.D.	Saint Paul

PHYSICIANS' ASSISTANCE

W. R. Humphrey, M.D.	Stillwater
Walter G. Benjamin, M.D.	Pipestone
James A. Blake, M.D.	Hopkins
Paul G. Boman, M.D.	Duluth
John Dordal, M.D.	Sacred Heart
Richard B. Graves, M.D.	Red Wing
Donald E. Hoganson, M.D.	Bemidji
Rolf Hovde, M.D.	Winthrop
L. W. Johnsrud, M.D.	Hibbing
Herman M. Juergens, M.D.	Belle Plaine
E. A. Kilbride, M.D.	Worthington
W. E. Macklin, Jr., M.D.	Willmar
Leo A. Nash, M.D.	Saint Paul
Raymond L. Page, M.D.	St. Charles
E. R. Sather, M.D.	Alexandria
C. G. Sheppard, M.D.	Hutchinson
Wm. F. Skaife, M.D.	Little Falls
M. D. Starekow, M.D.	Thief River Falls

PUBLIC HEALTH EDUCATION

F. J. Elias, M.D., *General Chairman*	Duluth

Executive Committee

F. J. Elias, M.D.	Duluth
R. M. Burns, M.D.	Saint Paul
H. M. Carryer, M.D.	Rochester
A. H. Wells, M.D.	Duluth

(And Chairmen of all Scientific Committees)

Editorial

A. H. Wells, M.D.	Duluth
K. W. Anderson, M.D.	Minneapolis
G. W. Clifford, M.D.	Alexandria
T. J. Edwards, M.D.	Saint Paul
Andrew V. Grinley, M.D.	Grand Rapids
H. W. Schmidt, M.D.	Rochester

Radio and Television

R. M. Burns, M.D.	Saint Paul
Elizabeth C. Bagley, M.D.	Duluth
David Carr, M.D.	Rochester
L. N. Dale, M.D.	Red Lake Falls
O. M. Heiberg, M.D.	Worthington
L. R. Prins, M.D.	Albert Lea
H. J. Reif, M.D.	St. Cloud
James Rogers Fox, M.D.	Minneapolis
A. A. Schmitz, M.D.	Mankato
Lewis J. Wilson, M.D.	Winona

Speakers' Bureau

H. M. Carryer, M.D.	Rochester
W. C. Dodds, M.D.	Detroit Lakes
J. W. Duncan, M.D.	Moorhead
Ben R. Geurs, M.D.	Mankato
P. A. Lommen, M.D.	Austin
O. L. N. Nelson, M.D.	Minneapolis
E. Irvine Parson, M.D.	Duluth
Charles Rea, M.D.	Saint Paul
W. B. Wells, M.D.	Jackson
Harold E. Wilmot, M.D.	Litchfield

RURAL MEDICAL SERVICE

First District

Paul C. Leck, M.D., *Chairman*	Austin

Second District

V. W. Doman, M.D.	Lakefield

Third District

L. J. Monson, M.D.	Canby

Fourth District

Lawrence Sjostrom, M.D.	St. Peter

Fifth District

A. K. Stratte, M.D. .... Pine City

Sixth District

W. W. Rieke, M.D. .... Wayzata

Seventh District

W. E. Fitzsimons, M.D. .... Brainerd

Eighth District

C. W. Jacobson, M.D. .... Breckenridge

Ninth District

J. K. Butler, M.D. .... Cloquet

RURAL MEDICAL SCHOLARSHIP COMMITTEE

F. J. Elias, M.D. .... Duluth
C. G. Sheppard, M.D. .... Hutchinson
E. J. Simons, M.D. .... Saint Paul

UNIVERSITY RELATIONS

A. O. Swenson, M.D. .... Duluth
O. J. Campbell, M.D. .... Minneapolis
Chas. C. Cooper, M.D. .... Saint Paul
F. J. Elias, M.D. .... Duluth
Justus Ohage, M.D. .... Saint Paul

COMMITTEE ON VETERANS AFFAIRS

Alvan Sach-Rowitz, M.D. .... Moose Lake
A. Erickson, M.D. .... Long Prairie
J. J. Eustermann, M.D. .... Mankato
J. E. Murphy, M.D. .... Marshall
E. I. Parson, M.D. .... Duluth
P. H. Soucheray, M.D. .... Saint Paul
C. H. Watkins, M.D. .... Rochester

AMERICAN MEDICAL EDUCATION FOUNDATION COMMITTEE

H. E. Drill, M.D., Chairman .... Hopkins

First Councilor District	W. A. Merritt, M.D., Rochester
Second Councilor District	Maurice D. Cooper, M.D. Winnebago
Third Councilor District	A. W. Diessner, M.D., Redwood Falls
Fourth Councilor District	John J. Eustermann, M.D., Mankato
Fifth Councilor District	C. E. Rea, M.D., Saint Paul
Sixth Councilor District	Malcolm A. McCannel, M.D., Minneapolis
Seventh Councilor District	Wilford J. DeWeese, M.D., Bemidji
Eighth Councilor District	M. D. Starekow, M.D. Thief River Falls
Ninth Councilor District	R. T. Seashore, M.D., Duluth

New STEELINE Pediatric Table

Eases the burden of the physician's daily work

Includes built-in tare balance scale, built-in measuring rod, foam rubber cushion and electrical outlets with cord and plug—there are no accessories to buy. Top quality construction features include all-welded steel body, two roomy drawers and a large open compartment with shelf, providing easy, unhampered access to instruments and supplies. Front edge is protected from wear by a stainless steel baffle plate. Despite the fact that this new table has been designed to provide the physician with the best modern equipment, efficient modern production methods in our own factory permit us to keep the price well below that of comparable models. Write today for complete information.

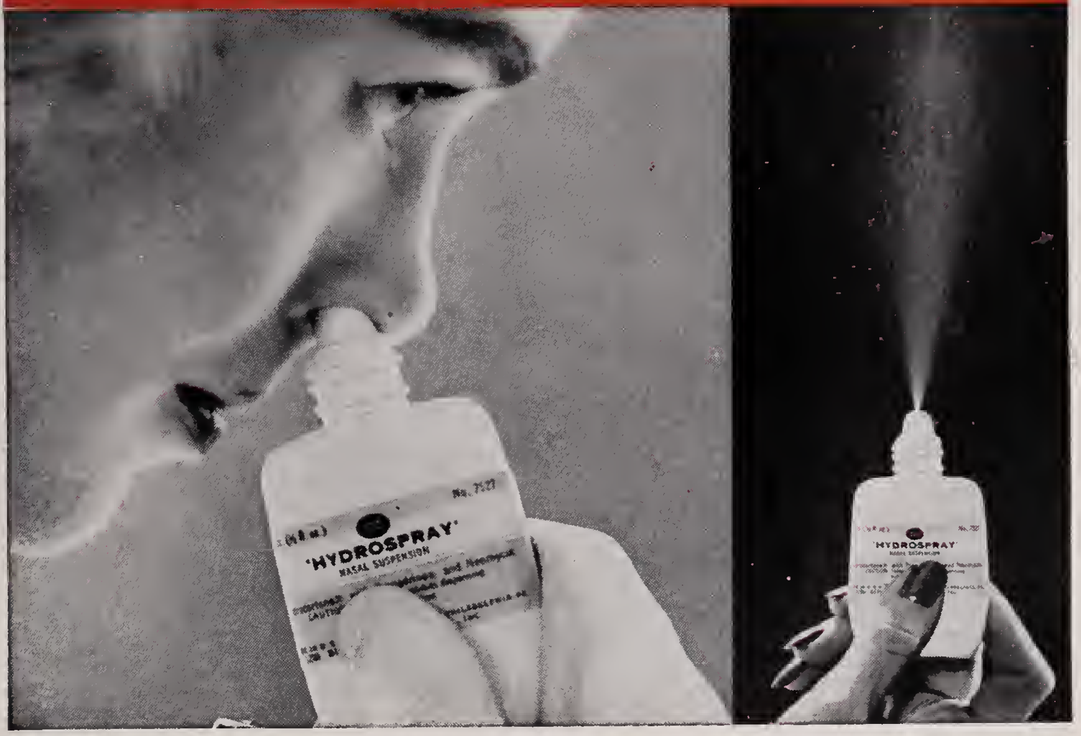
a. s. aloe company OF MINNESOTA
927 Portland Avenue, Minneapolis 4, Minn. • Phone: FEderal 8-7601

'Hydrospray' NASAL SUSPENSION

(HYDROCORTONE® WITH PROPADRINE® AND NEOMYCIN)

Anti-inflammatory—
Decongestant—Antibacterial

MAJOR ADVANTAGES: New synergistic anti-inflammatory, decongestant and antibacterial formula. High steroid content assures effective response.



Topically applied hydrocortisone[1] in therapeutic concentrations has been shown to afford a significant degree of subjective and objective improvement in a high percentage of patients suffering from various types of rhinitis. HYDROSPRAY provides HYDROCORTONE in a concentration of 0.1 % plus a safe but potent decongestant, PROPADRINE, and a wide-spectrum antibiotic, Neomycin, with low sensitization potential. This combination provides a three-fold attack on the physiologic and pathologic manifestations of nasal allergies which results in a degree of relief that is often greater and achieved faster than when any one of these agents is employed alone.

INDICATIONS: Acute and chronic rhinitis, vasomotor rhinitis, perennial rhinitis and polyposis.

SUPPLIED: In squeezable plastic spray bottles containing 15 cc. HYDROSPRAY, each cc. supplying 1 mg. of HYDROCORTONE, 15 mg. of PROPADRINE Hydrochloride and 5 mg. of Neomycin Sulfate (equivalent to 3.5 mg. of neomycin base).

SHARP & DOHME
Philadelphia 1, Pa.
DIVISION OF MERCK & CO., INC.

REFERENCE: 1. Silcox, L. E., *A.M.A. Arch. Otolaryng.* 60:431. Oct. 1954.

the efficacy and safety of Pentids have been confirmed by clinical experience in many millions of patients

Pentids

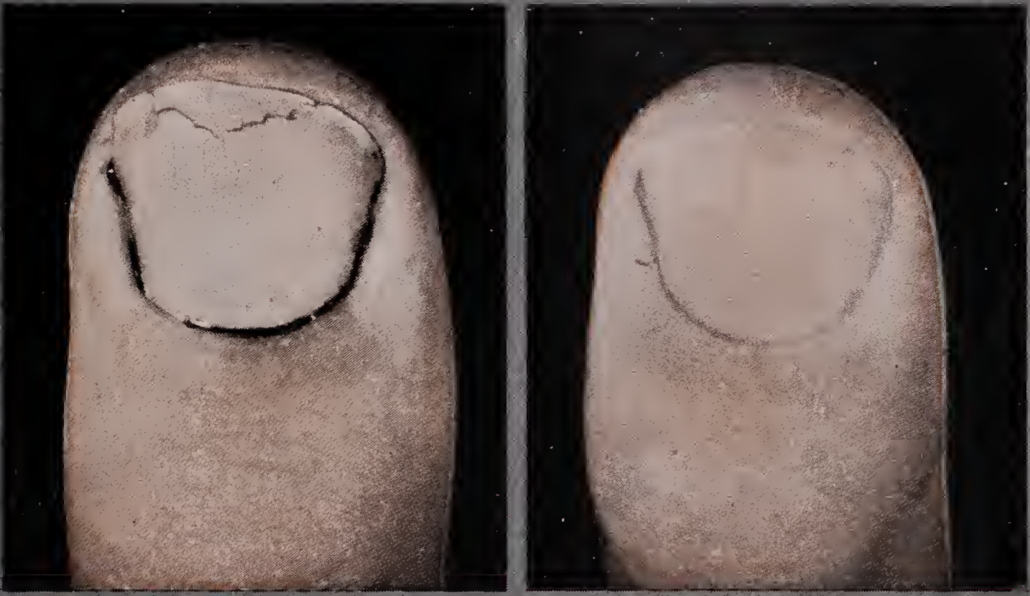
Squibb 200,000 Units Penicillin G Potassium

tablets (buffered)
bottles of 12 and 100
PENTIDS® IS A SQUIBB TRADEMARK

SQUIBB

capsules (unbuffered)
bottles of 24 and 100
for infants and children

KNOX Protein Previews



New Study Shows Gelatine Restores Brittle Fingernails to Normal

KNOX
UNFLAVORED
32
GELATINE

Directions for making the Knox Gelatine drink in every package

Brittle, fragile or laminating fingernails are the bane of many a woman's existence. Yet this highly prevalent and distressing condition often has gone uncontrolled for lack of effective therapy. Now, you can promise these patients substantial relief in a large percentage of cases.

In a recent study[1] that confirmed previous work[2] Knox Gelatine was used to treat 36 women with fragile, brittle, laminating fingernails. The response was most gratifying. Except for three patients who discontinued the therapy, three diabetics, and two women who had congenital deformities, the splitting ceased and all other patients were able to manicure their nails to a full point by the time the study ended.

Optimal dosage proved to be one envelope (7 grams) of Knox Gelatine administered daily for three months. Improvement, however, was noted after the first month. If you would like more complete details of this work, just use the coupon.

---

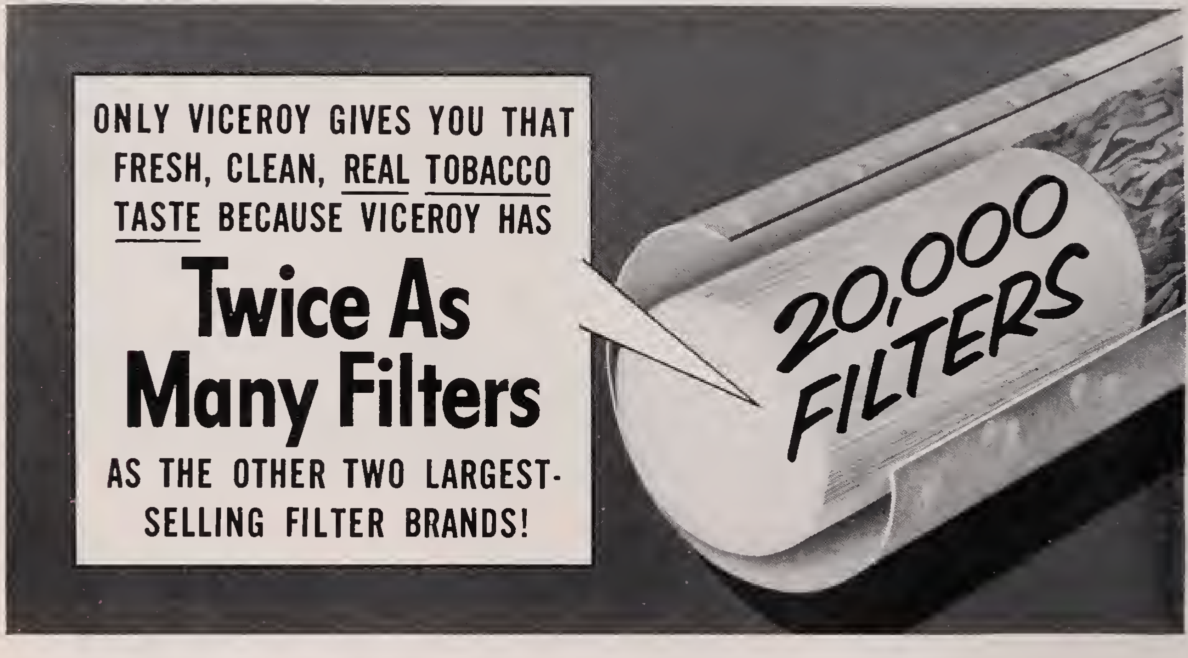
1. Rosenberg, S. and Oster, K. A., "Gelatine in the Treatment of Brittle Nails," *Conn. State Med. J.* **19**:171-179, March 1955.
2. Tyson, T. L., *J. Invest. Dermat.* **14**:323, May 1950.

Chas. B. Knox Gelatine Company, Inc.
Professional Service Dept. SJ-14
Johnstown, N. Y.

Please send me a reprint of the article by Rosenberg and Oster with illustrated color brochure.

YOUR NAME AND ADDRESS

What makes Viceroy different from other filter cigarettes?



ONLY VICEROY GIVES YOU THAT FRESH, CLEAN, REAL TOBACCO TASTE BECAUSE VICEROY HAS

Twice As Many Filters

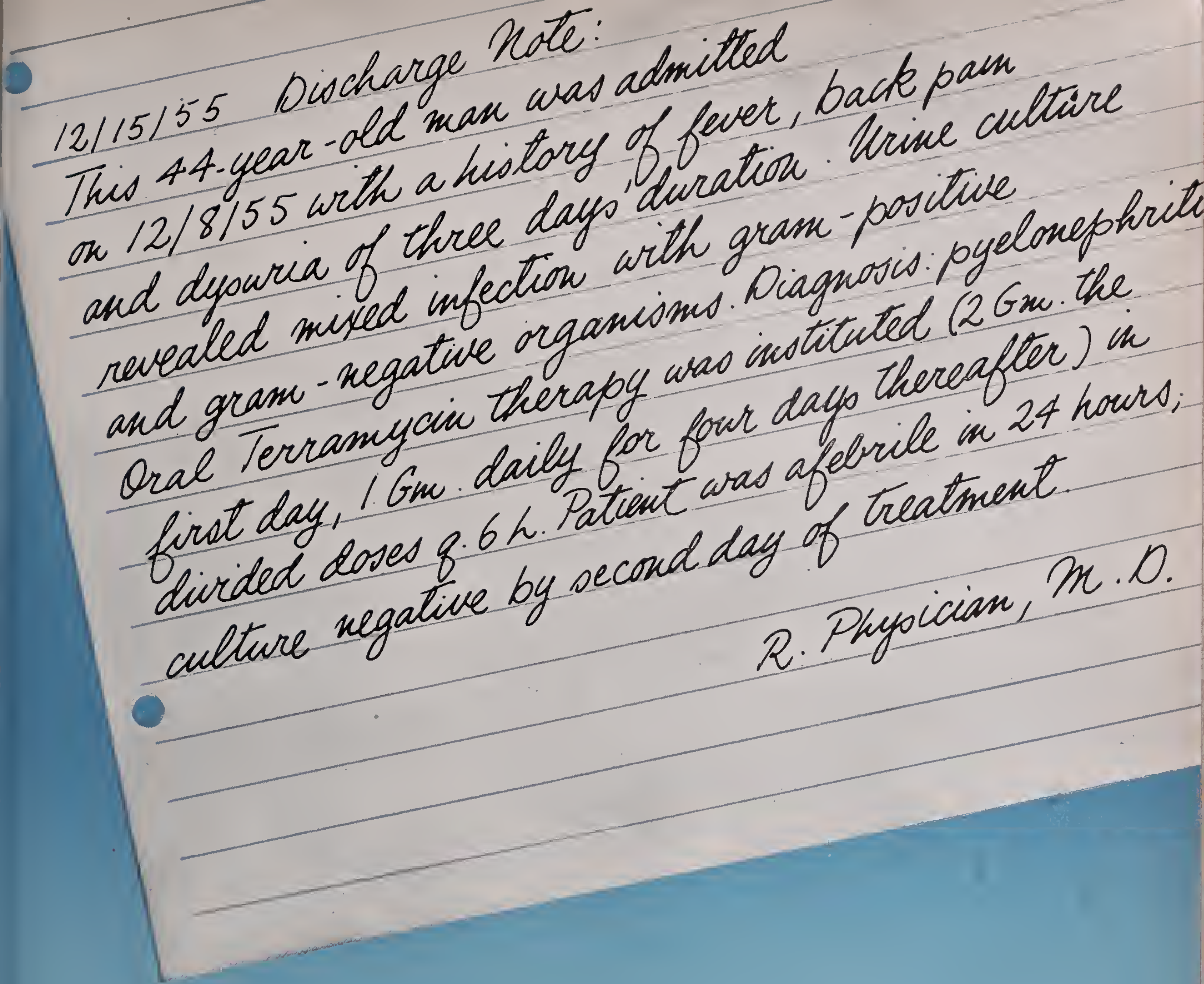
AS THE OTHER TWO LARGEST-SELLING FILTER BRANDS!

The VICEROY filter tip contains 20,000 tiny filters made exclusively from pure cellulose . . . soft, snow-white, natural. This is twice as many filters as the other two largest-selling filter brands. That is why VICEROY gives you such a fresh, clean taste—that real tobacco taste you miss in other filter brands. No wonder so many doctors now smoke and recommend King-Size VICEROYS.

If it's Viceroy you can tell the difference blindfolded!

VICEROY
Filter Tip
CIGARETTES
KING-SIZE

King-Size Filter Tip **VICEROY**



12/15/55 Discharge Note:
This 44-year-old man was admitted
on 12/8/55 with a history of fever, back pain
and dysuria of three days' duration. Urine culture
revealed mixed infection with gram-positive
and gram-negative organisms. Diagnosis: pyelonephriti
Oral Terramycin therapy was instituted (2 Gm. the
first day, 1 Gm. daily for four days thereafter) in
divided doses q. 6 h. Patient was afebrile in 24 hours;
culture negative by second day of treatment.

R. Physician, M.D.

Your histories

are making medical history

in the golden age of antibiotic medicine

TERRAMYCIN®

Brand of oxytetracycline

Reports by thousands of physicians on millions of cases have built confidence in Terramycin as a well-tolerated, broad-spectrum antibiotic of choice—now finishing its sixth year of successful clinical use.

Pfizer PFIZER LABORATORIES, *Division, Chas. Pfizer & Co., Inc.*, Brooklyn 6, N.Y.

for a greater margin
of security
in corticosteroid therapy

- minimizes sodium retention edema
- dietary regulation seldom necessary

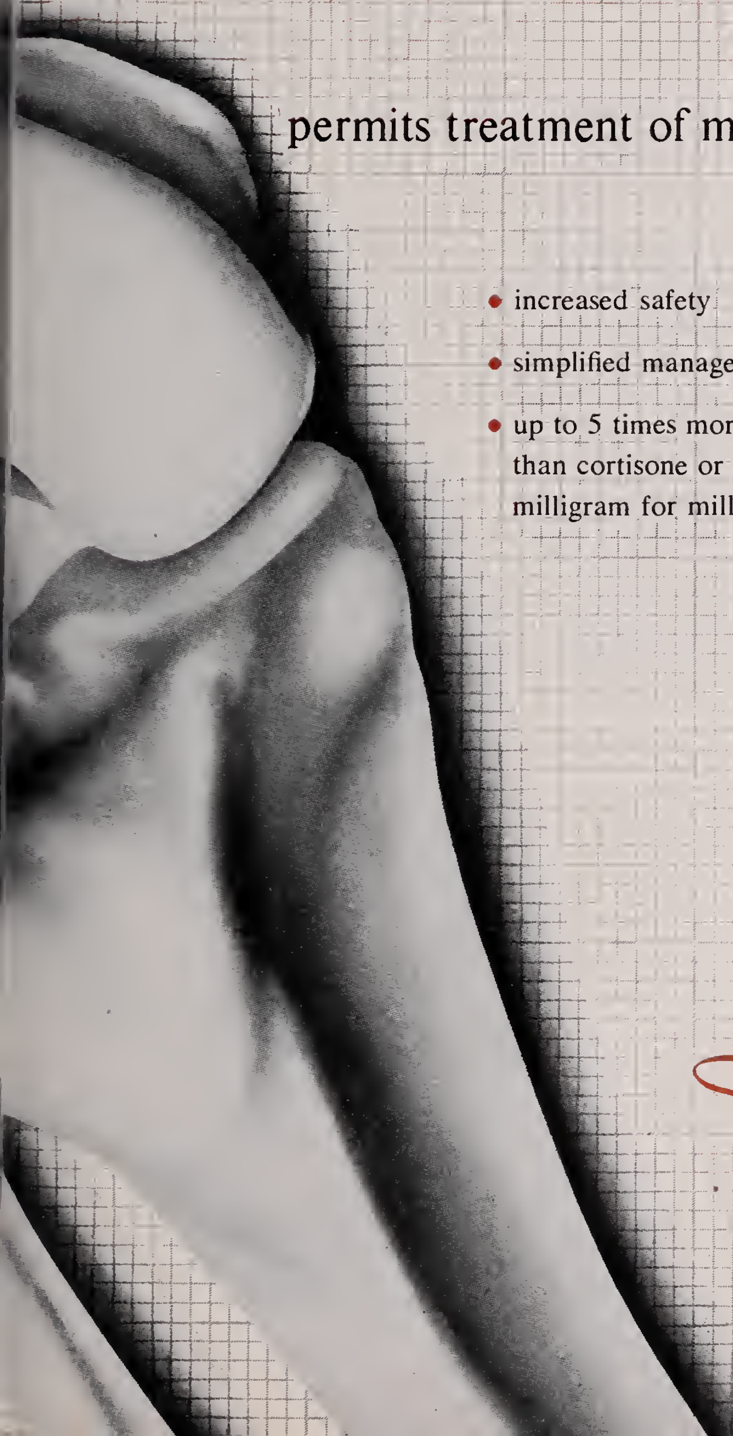
in **rheumatoid arthritis:** better relief of pain, swelling, tenderness; diminishes joint stiffness

intractable asthma: better relief of bronchospasm, dyspnea, cough; increases vital capacity

collagen diseases and allergies: hormone benefits with decreased electrolyte side effects

METICORTEN is available in the following forms:
1 mg., 2.5 mg. and 5 mg. tablets
2.5 mg. and 5 mg. capsules
*T.M.

MC-J-66-1255



rather than cortisone
or hydrocortisone

METICORTEN*
PREDNISONE

permits treatment of more patients

- increased safety
- simplified management
- up to 5 times more effective than cortisone or hydrocortisone, milligram for milligram

Schering

Income* for the members of the Minnesota Medical Profession from the first day* of sickness or injury . . .

NOW! Not for only 26 weeks

— Not for only 52 weeks

but even for your entire lifetime

House Confinement not required at any time

Accidental loss of hands, feet or eyesight pays monthly benefits — not just a lump sum

TAX FREE DOLLARS — Disability insurance income is not taxable. For example, $3600 disability insurance income is equivalent to about $5000 regular income

EXTRA BENEFITS — Double monthly benefits while you are hospitalized payable for as long as three months

Cash benefits for accidental death

Double income benefits if disabled in specified travel accident named in the policy

OTHER IMPORTANT FEATURES — Waiver of Premium Provision — Limited Commercial Air Line Passenger Coverage — No Automatic Termination Age During Policy Period — A Special Renewal Agreement

Covers most accidents from date of policy and most sickness originating more than 30 days after date of policy, excepting those incurred while in military service of any country at war, or resulting from war, any act of war, suicide, attempted suicide, insanity, mental disease, certain foreign travel, any pre-existing condition or any hazard of aviation other than commercial air line passenger travel

UNITED INSURANCE COMPANY OF AMERICA

MP

UNITED INSURANCE COMPANY OF AMERICA, Lifetime Disability Income Department
607 Marquette Ave., Minnesota Federal Bldg., Minneapolis, Minn.

I would like more information about your lifetime disability income protection

I understand I shall not be obligated

Name .... Age ....

Address ....
or attach letterhead

*** Income payable from first day of medical attention and as long as continuous total disability, total loss of time and medical attendance continue**

Mail coupon today while you are still healthy

"She can go home tomorrow"—

When you prescribe Gantrisin for patients with bacterial infections, they usually get back in their stride quickly. For this single, highly soluble sulfonamide produces high plasma and urine levels ... has a wide antibacterial spectrum ... and is well tolerated.

Gantrisin® 'Roche' - brand of sulfisoxazole

Hoffmann - La Roche Inc · Nutley · N.J.

No buttoned lips—

...when there is no "medicine taste":

Gantrisin (acetyl) Pediatric Suspension has a

delicious raspberry flavor -- in liquid form --

and provides the same wide-spectrum effectiveness,

high plasma and urine levels as Gantrisin,

the widely-used single sulfonamide.

Gantrisin® acetyl - brand of acetyl sulfisoxazole

Hoffmann - La Roche Inc • Nutley • N.J.

NOW IN TWO POTENCIES

for more precise dosage

NEW 1 mg. *pink* tablet | 5 mg. tablet

MOST POTENT
ANTI-RHEUMATIC

Sterane*

Both tablets are deep-scored and of the
SAME DISTINCTIVE "FINGER-GRIP" SIZE AND SHAPE
for ease of handling and breaking by arthritic fingers.

anti-rheumatic/anti-allergic/anti-inflammatory

supplied: **Pink,** 1 mg. oral tablets, bottles of 100.
White, 5 mg. oral tablets, bottles of 20 and 100.

PFIZER LABORATORIES
Division, Chas. Pfizer & Co., Inc.
Brooklyn 6, New York

*brand of prednisolone

A NEW

Chemical Compound

for the treatment of

PEPTIC ULCERS and HYPERACIDITY

GLYCAMINE®

TABLETS

GLYCAMINE BRAND OF HYDROXY ALUMINUM
MAGNESIUM AMINOACETATE
PAT. PEND.

PROMPT, LONG LASTING RELIEF — One tablet is sufficient to neutralize excess acidity and maintain optimum pH for 4½ hours.

A NEW CHEMICAL COMPOUND — Designed to perform a specific function . . . not a mixture of alkalis. Will not disturb acid-base balance.

RE-ESTABLISHES NORMAL DIGESTION — Does not affect enzymatic activity. Improves patient well being.

CONTROLLED ACTION — Does not stimulate acid secretion or alkalosis. No acid rebound.

NON-SYSTEMIC — Neither constipating nor laxative. Demulcent protective coating covers abraded mucosa.

COMPATIBLE — With antispasmodics and anticholinergics. Reduces gastric distress caused by many drugs.

LOW DOSAGE — Only four pleasant tasting, chew-up tablets daily. Economical to use. Assures better patient co-operation.

AVAILABLE — In bottles of 100, 500 and 1000 tablets in all drug stores.

For latest professional information and samples write

DALCO PHARMACAL CO.

Minneapolis 2, Minn.

Division of

JOSEPH E. DAHL CO., Minneapolis and St. Paul

New Evidence

again demonstrates the antihypertensive value of

Rauwiloid®

THE ORIGINAL ALSEROXYLON

Rauwiloid® / *In Mild Labile Hypertension*

Up to 80% of mild hypertensives respond[1]...and with less danger of depression[2] than with single alkaloidal preparations.

Easy to prescribe...uncomplicated dosage...two 2 mg. tablets at bedtime.

Rauwiloid® + Veriloid® / *In Moderate to Severe Hypertension*

Single-tablet medication combines 3 mg. Veriloid (alkavervir), a potent hypotensive agent noteworthy for its safety,[3] with 1 mg. Rauwiloid. High efficacy from lower Veriloid dosage, with greatly reduced side actions to Veriloid. Initial dose, one tablet t.i.d., p.c.

Rauwiloid® + Hexamethonium/ *In Severe, Otherwise Intractable Hypertension*

Combines ganglionic blockade action of hexamethonium chloride dihydrate (250 mg. per tablet) with Rauwiloid (1 mg.) in a single tablet for easier, safer, ambulatory management of severe cases. Initial dose, ½ tablet q.i.d.

---

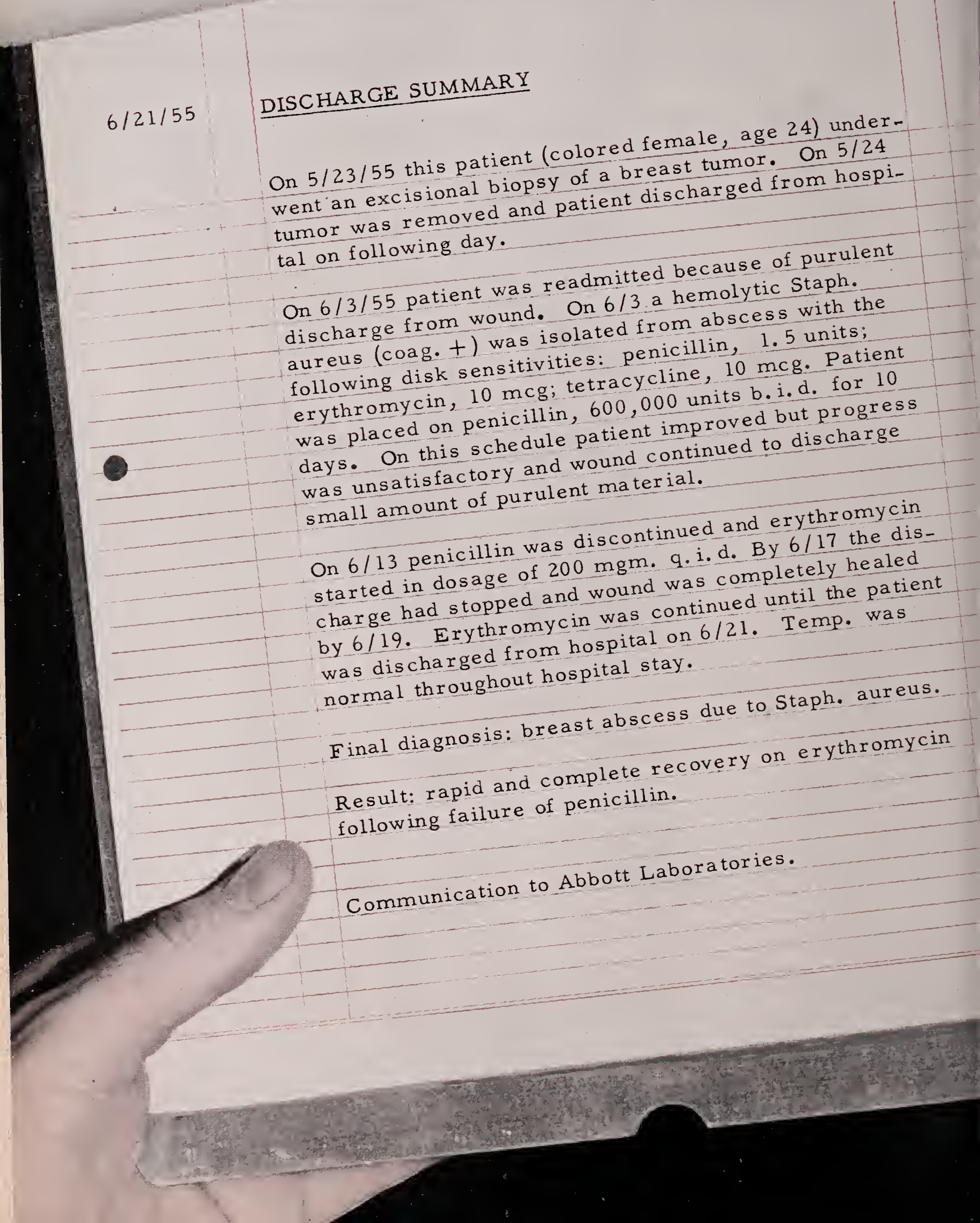
1. Moyer, J.H., in discussion of Galen, W.P., and Duke, J.F.: Outpatient Treatment of Hypertension with Hexamethonium and Hydralazine. South. M.J. *47*:858 (Sept.) 1954.
2. Moyer, J.H.; Dennis, E., and Ford, R.: Drug Therapy (Rauwolfia) of Hypertension. II. A Comparative Study of Different Extracts of Rauwolfia When Each Is Used Alone (Orally) for Therapy of Ambulatory Patients with Hypertension, A.M.A. Arch. Int. Med. *96*:530 (Oct.) 1955.
3. Wilkins, R.W.; Stanton, J.R., and Freis, E.D.: Essential Hypertension. Therapeutic Trial of Veriloid, a New Extract of Veratrum viride, Proc. Soc. Exper. Biol. & Med. *72*:302 (Nov.) 1949.

When Angina Complicates Hypertension

Pentoxylon® Each long-acting tablet contains 1 mg. Rauwiloid and 10 mg. pentaerythritol tetranitrate (PETN). Lessens incidence and severity of attacks, overcomes tachycardia, calms fear and tension. Lowers elevated, but not normal blood pressure. Dosage: one to two tablets q.i.d., before meals and on retiring.

Riker
LOS ANGELES

Erythromycin in treatment of abscess



6/21/55

DISCHARGE SUMMARY

On 5/23/55 this patient (colored female, age 24) underwent an excisional biopsy of a breast tumor. On 5/24 tumor was removed and patient discharged from hospital on following day.

On 6/3/55 patient was readmitted because of purulent discharge from wound. On 6/3 a hemolytic Staph. aureus (coag. +) was isolated from abscess with the following disk sensitivities: penicillin, 1.5 units; erythromycin, 10 mcg; tetracycline, 10 mcg. Patient was placed on penicillin, 600,000 units b.i.d. for 10 days. On this schedule patient improved but progress was unsatisfactory and wound continued to discharge small amount of purulent material.

On 6/13 penicillin was discontinued and erythromycin started in dosage of 200 mgm. q.i.d. By 6/17 the discharge had stopped and wound was completely healed by 6/19. Erythromycin was continued until the patient was discharged from hospital on 6/21. Temp. was normal throughout hospital stay.

Final diagnosis: breast abscess due to Staph. aureus.

Result: rapid and complete recovery on erythromycin following failure of penicillin.

Communication to Abbott Laboratories.

pecific against
occic infections

Now, you can prescribe an antibiotic (*Filmtab* ERYTHROCIN) that provides *specific therapy* against staph-, strep- or pneumococci. Since these organisms cause most bacterial respiratory infections (and since they are the very organisms most sensitive to ERYTHROCIN) doesn't it make good sense to prescribe ERYTHROCIN when the infection is coccic?

filmtab®

Erythrocin®
(Erythromycin, Abbott)
STEARATE

ith little risk of
erious side effects

Since ERYTHROCIN is inactive against gram-negative organisms, it is less likely to alter intestinal flora—with an accompanying low incidence of side effects. Also, your patients seldom get the allergic reactions sometimes seen with penicillin. Or loss of accessory vitamins during ERYTHROCIN therapy. *Filmtab* ERYTHROCIN (100 and 250 mg.), bottles of 25 and 100.

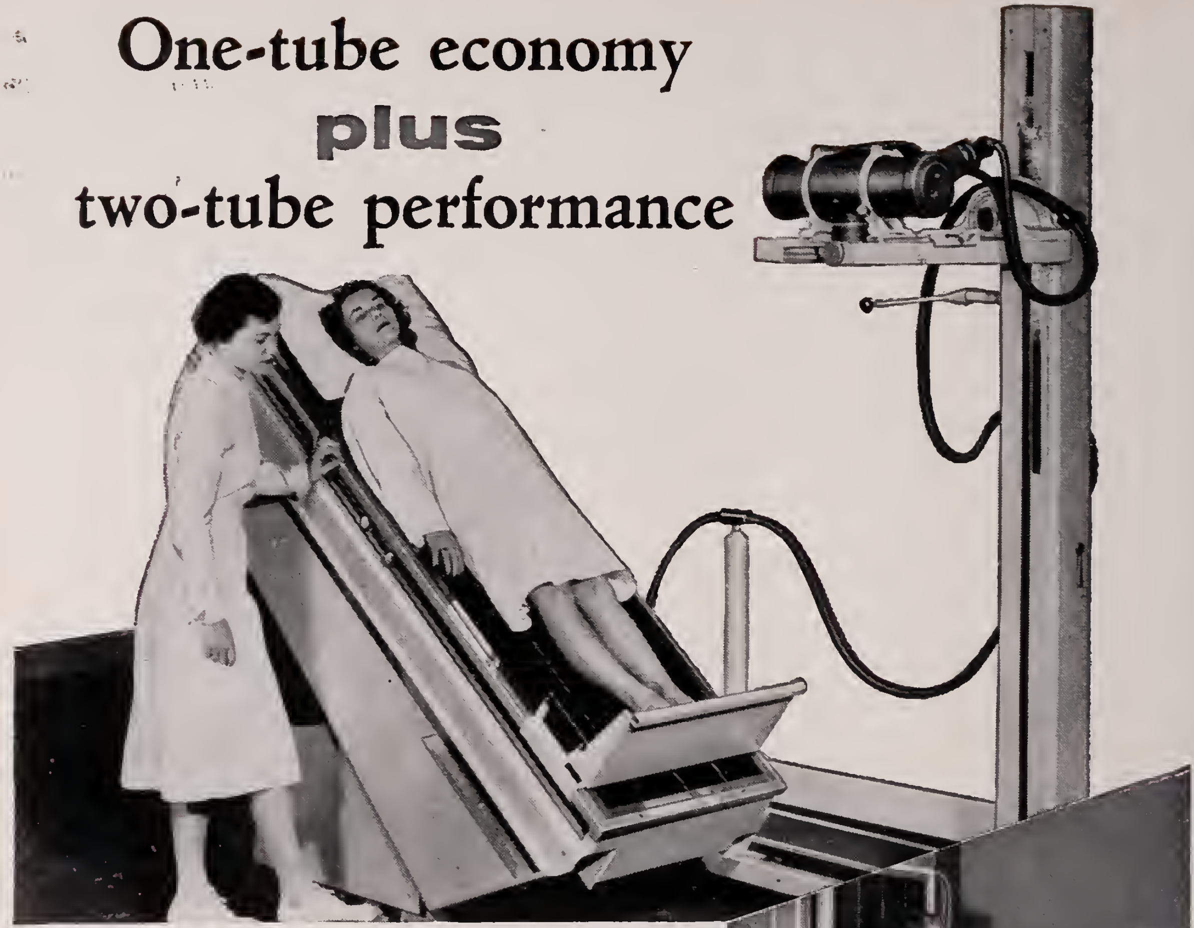
Abbott

filmtab®

Erythrocin®
(Erythromycin, Abbott)
STEARATE

®Filmtab—Film sealed tablets; patent applied for.

One-tube economy
plus
two-tube performance



YOURS with the 200-ma MAXICON® X-ray Unit

This modestly priced single-tube unit brings you fully professional radiographic and fluoroscopic facilities. These include the generous full-length table . . . broad-coverage independent tube stand . . . powerful 200-ma transformer . . . high-power rotating-anode tube. You also get:

Full-wave rectification — Brings you *full* 200-ma power for clear, sharp radiographs. Shorter exposures stop motion even when working with obese patients.

Quality that cuts costs — Professionally scaled components mean economical, dependable service.

Room to grow — Later, should you desire to expand your Maxicon installation, you can add a separate under-table tube.

No need to buy! — If you prefer, enjoy all these advantages on the G-E Maxiservice® rental plan with *no* capital investment. Your G-E x-ray representative will give you full details. Contact him at the address below.

Progress Is Our Most Important Product

GENERAL ELECTRIC

Direct Factory Branches:
MINNEAPOLIS — 808 Nicollet Avenue
DULUTH — 928 East 2nd Street

Resident Representatives:
MANKATO — J. F. Van Osdell, 123 Blue Earth
ST. PAUL — R. H. Holen, 153 W. Robie
SIOUX FALLS — H. L. Norlin, 1908 S. Sixth Street

Upjohn

Ulcer protection that lasts all night:

Pamine*-Phenobarbital

BROMIDE

Tablets

Each FULL-STRENGTH tablet contains:

Phenobarbital	15.0 mg. (1/4 gr.)
Methscopolamine bromide	2.5 mg.

Dosage:

One tablet one-half hour before meals, and 1 to 2 tablets at bedtime.

Each HALF-STRENGTH tablet contains:

Phenobarbital	8.0 mg. (1/8 gr.)
Methscopolamine bromide	1.25 mg.

Dosage:

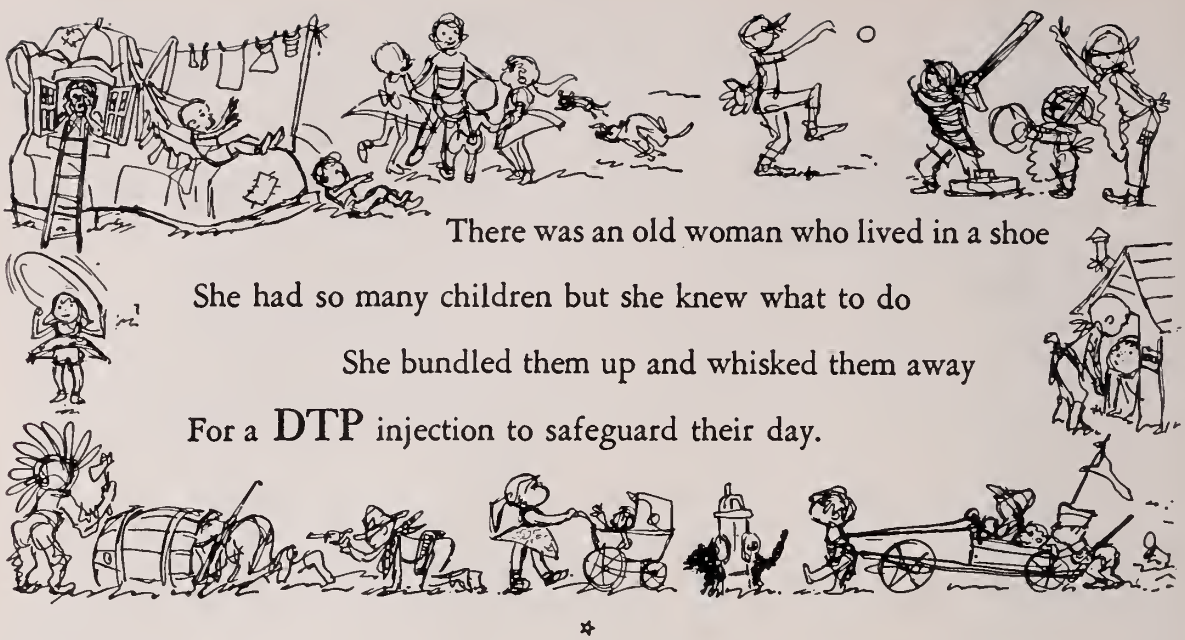
While the dosage and indications are the same as for the full-strength tablets, this tablet allows greater flexibility in regulating the individual dose, and may be employed in less severe gastrointestinal conditions.

Supplied:

Both strengths in bottles of 100 tablets.

*REGISTERED TRADEMARK FOR THE UPJOHN BRAND OF METHSCOPOLAMINE

The Upjohn Company, Kalamazoo, Michigan



There was an old woman who lived in a shoe
She had so many children but she knew what to do
She bundled them up and whisked them away
For a DTP injection to safeguard their day.

- **One complete immunization**
- **99% of nonspecific protein removed**

DTP DIPHTHERIA AND TETANUS TOXOIDS AND PERTUSSIS VACCINE COMBINED.

Alum Precipitated or Plain.

- **Meets most rigid specifications**
- **Freedom from tissue irritation**
- **Maximum antigenicity with minimum of untoward reactions**

Additional products in The National Drug Company's most complete line of biologicals.

TETANUS ANTITOXIN
INFLUENZA VIRUS VACCINE, POLYVALENT
SMALLPOX VACCINE
GAS GANGRENE ANTITOXIN, TRIVALENT
TETANUS-GAS GANGRENE ANTITOXIN, POLYVALENT

★ LEADING PRODUCERS OF BIOLOGICALS ★

Tetanus Toxoid, Alum Precipitated or Plain. Diphtheria Antitoxin. Diphtheria Toxin for Schick Test. Diphtheria Toxoid, Alum Precipitated or Plain. Diphtheria and Tetanus Toxoids, Alum Precipitated. Pertussis Vaccine, Alum Precipitated or Plain. Rabies Vaccine. Rhus Tox Antigen. Typhoid Vaccine. Typhoid-Paratyphoid Vaccine. Catarrhalis Combined Vaccine for prophylaxis and treatment of the bacterial complications of the common cold. Staphylococcus-Toxoid-Vaccine Vatox. Strepto-Combined Vaccine. Strepto-Staphylo Vatox. Yellow Fever Vaccine.

* * *

Established for Highest Quality

Careful selection and processing of all ingredients under supervision of leading bacteriologists guarantees uniformly high potency, purity and efficacy of each product. Minimum of untoward reactions.

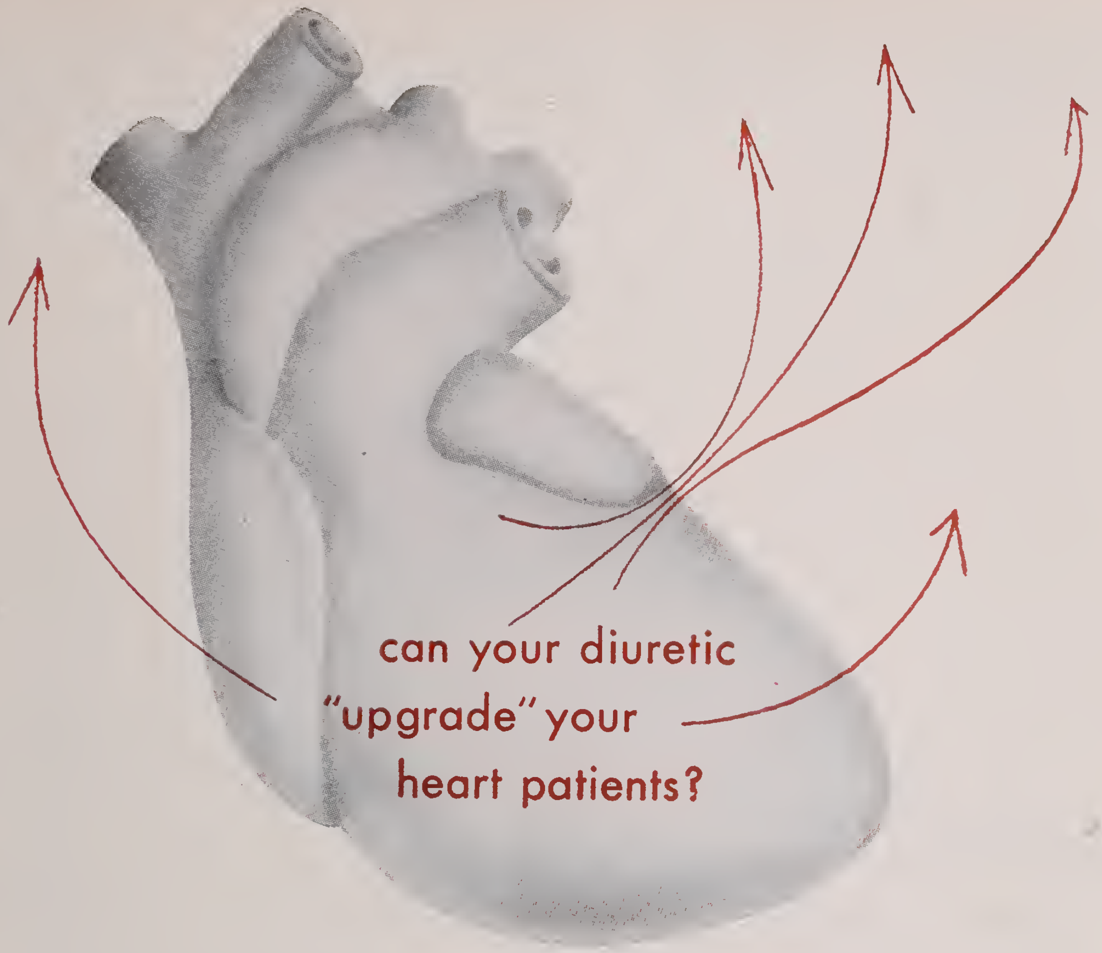
Complete directions, including dosage, route and technique of administration, precautions and contraindications if any, are given in the individual package inserts which accompany each product.

A supply of records of immunizations and tests are available to physicians on request.

PRODUCTS OF ORIGINAL RESEARCH

NATIONAL NATIONAL NATIONAL NATIONAL NATIONAL NATIONAL

THE NATIONAL DRUG COMPANY PHILADELPHIA 44, PA.



know your diuretic

fewer restrictions of activity are the benefit of prolonged use of those diuretics effective over the entire range of cardiac failure. The organomercurials—parenteral and oral—improve the classification and prognosis of your decompensated patients. Diuretics of value only in milder grades of failure, or which must be given intermittently because of refractoriness or side effects, are incapable of "upgrading" the cardiac patient.

TABLET
NEOHYDRIN®
BRAND OF CHLORMERODRIN

(18.3 MG. OF 3-CHLOROMERCURI-2-METHOXY-PROPYLUREA IN EACH TABLET)

for "...a new picture of the patient in congestive heart failure."*
replaces injections in 80% to 90% of patients
*Leff, W., and Nussbaum, H. E.: J. M. Soc. New Jersey 50:149, 1953.

a standard for initial control of severe failure
MERCUHYDRIN® SODIUM
BRAND OF MERALLURIDE INJECTION

Leadership in diuretic research
Lakeside LABORATORIES, INC., MILWAUKEE 1, WISCONSIN

88855

CHILD OR GRANDCHILD?

Is there a future education you would like to assure? A Municipal Bond with tax-free interest can be purchased to come due at any future date you wish.

For more details write for our free Booklet . . .

MUNICIPAL BONDS AND YOU
By George, This is it!
THE KIND of INVESTMENT I'VE ALWAYS WANTED!
● SAFETY OF PRINCIPAL
● REGULAR INCOME
● GOOD RESALE
and TAX FREE too!
LOOK INSIDE
YES, THERE IS SUCH AN INVESTMENT!

"MUNICIPAL BONDS AND YOU"

Name______________________________

Address____________________________

City__________________ State________

MM-2-6

JURAN & MOODY, INC.

Municipal Bonds Exclusively

Rand Tower
MINNEAPOLIS 2

Citizens and Southern Building
ATLANTA, GA.
TELEPHONE: CApital 4-9661

93 East 6th St.
ST. PAUL 1

HydroCortone®
(HYDROCORTISONE, MERCK)

A valuable aid in rehabilitating the arthritic patient

MAJOR ADVANTAGES: Greater anti-rheumatic activity than cortisone; smaller doses produce clinical improvement faster and more uniformly.[1]

HYDROCORTONE is a practical long-term therapeutic measure in the majority of patients suffering from rheumatoid arthritis. The use of small doses of HYDROCORTONE in conjunction with conservative general measures will permit the safe management of these arthritics for prolonged periods of time. Such a program has been shown to provide moderate to great relief in a very high percentage of patients.[2] In severely handicapped people, HYDROCORTONE plus physical therapy will frequently allow the rehabilitation of arthritics who would not be helped appreciably by either measure alone.[3]

OTHER INDICATIONS: Still's Disease, rheumatoid spondylitis, psoriatic arthritis, traumatic arthritis, osteoarthritis, and bursitis.

SUPPLIED: ORAL—HYDROCORTONE Tablets: 20 mg., bottles of 25, 100, and 500 tablets; 10 mg., bottles of 50, 100, and 500 tablets; 5 mg., bottles of 50 tablets. **INTRASYNOVIAL**—Saline Suspension HYDROCORTONE-T.B.A.: 25 mg./cc., vials of 5 cc. Saline Suspension HYDROCORTONE Acetate: 25 mg./cc., vials of 5 cc.

SHARP & DOHME
PHILADELPHIA 1, PA.
DIVISION OF MERCK & CO., INC.

REFERENCES: 1. Boland, E. W. and Headley, N. E., *J.A.M.A.* **148**:981, March 22, 1952. 2. Ward, L. E., Polley, H. F., Slocumb, C. H. and Hench, P. S., *J.A.M.A.* **152**:119, May 9, 1953. 3. Snow, W. B. and Coss, J. A., *N.Y. State J. Med.* **52**:319, Feb. 1, 1952.

WHY SENSITIZE

in topical and ophthalmic infections

USE 'POLYSPORIN'®

brand

POLYMYXIN B—BACITRACIN OINTMENT

to insure broad-spectrum therapy with minimum allergenicity

For topical use: in ½ oz. and 1 oz. tubes.
For ophthalmic use: in ⅛ oz. tubes.

BURROUGHS WELLCOME & CO. (U.S.A.) INC., Tuckahoe, N. Y.

PEN·VEE·*Oral**

TABLETS

Penicillin V, Crystalline
(Phenoxymethyl Penicillin)

*Trademark

the totally new penicillin for decisive oral dependability

- Formulated specifically for oral use
- Acid-stable—virtually unaffected by gastric acid
- Alkaline-soluble—optimally absorbed in duodenum
- Certain, high blood levels

Supplied: Tablets, 125 mg. (200,000 units), bottles of 36; 300 mg. (500,000 units), bottles of 12. Also available: Tablets BICILLIN®•VEE, 100 mg. (100,000 units) of benzathine penicillin G and 62.5 mg. (100,000 units) of penicillin V, bottles of 36.

Wyeth®
Philadelphia 1, Pa.

when patients complain of ▶

unexcelled relief in nonspec

NEW SIG

best of the old	Acetylsalicylic acid . .	325 m
potentiated by the best of the new . . .	METICORTEN	0.75 m
augmented by	Ascorbic acid	20 m
plus	Aluminum hydroxide .	75 m

METICORTEN (prednisone), new Schering corticosteroid, has three to fi
times the therapeutic effectiveness, milligram for milligram, of oral cor
sone or hydrocortisone. Combined in SIGMAGEN with aspirin and ascor
acid, it permits unexcelled maintenance of "rheumatic" relief at mini
dosages.

Schering

neck • *backache* • *charleyhorse* • *rheumatics*

lumbago • *glass arm* • *devil's grip* • *bursitis*

nis elbow • *trigger finger* • *sciatica* • *neuralgia*

eumatic disorders

AGEN

TABLETS

dicated in

scular rheumatism • *mild rheumatoid arthritis* • *myalgia*

ild spondylitis • *fibrositis* • *myositis* • *subacute gout*

pleurodynia • *tenosynovitis* • *panniculitis* • *frozen-shoulder*

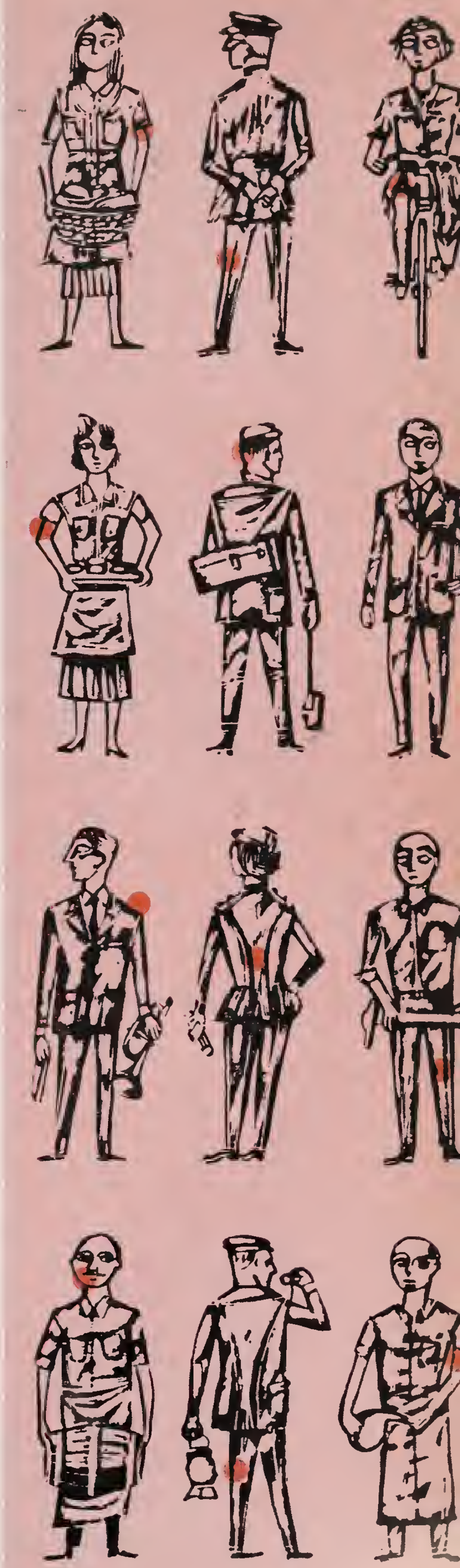
ckaging

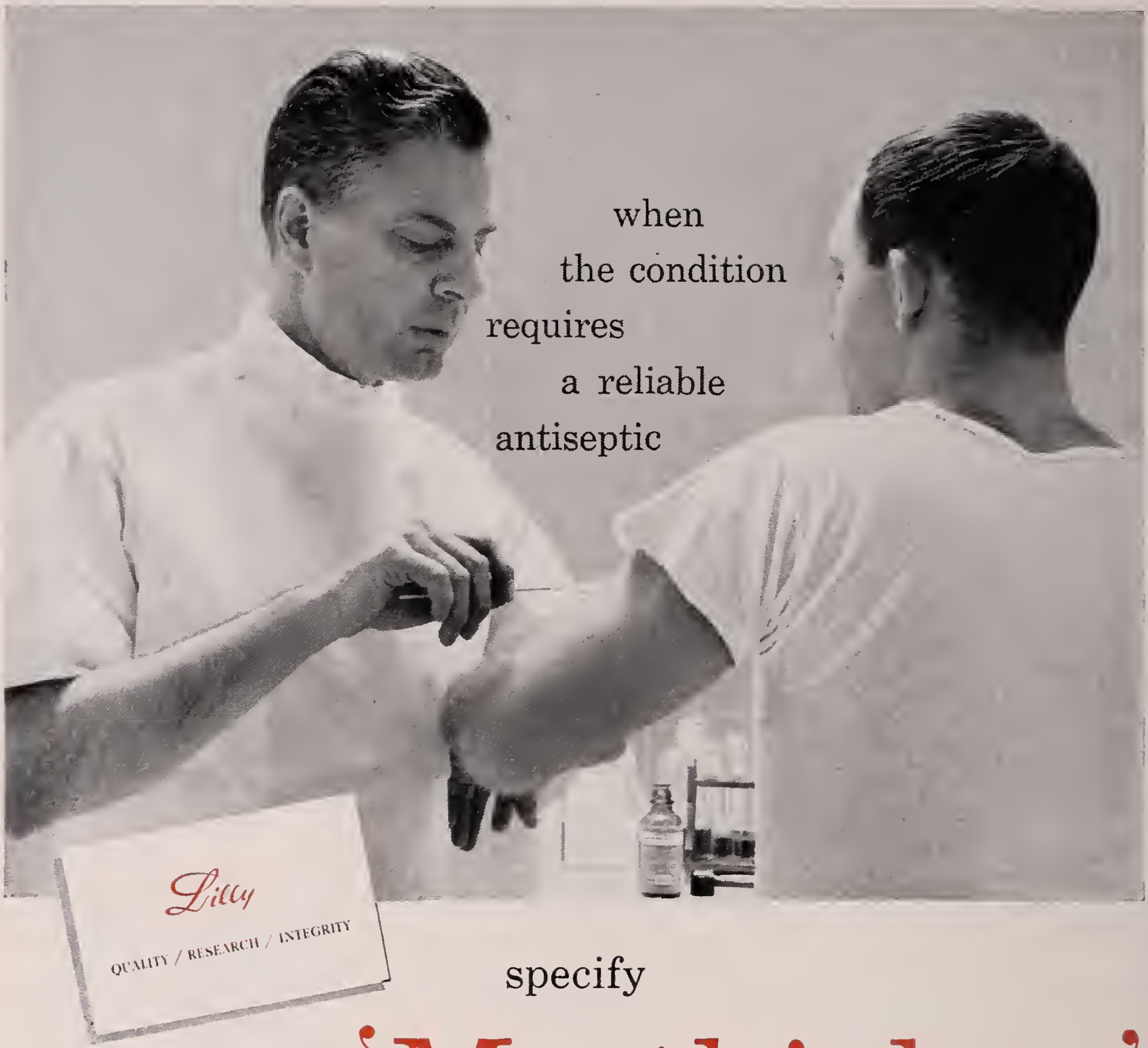
tles of 100 and 1000.

MAGEN.* brand of corticoid-analgesic compound.

TICORTEN.* brand of prednisone.

1.




when
the condition
requires
a reliable
antiseptic
Lilly
QUALITY / RESEARCH / INTEGRITY

specify

'Merthiolate'

(THIMEROSAL, LILLY)

'Merthiolate' is highly active under virtually all conditions; is relatively nonirritating and nontoxic

'Merthiolate' is germicidal in dilutions up to 1:4,000 in serum media and is relatively nonirritating in the concentrations suggested for use. It also maintains its activity in the presence of soaps. The fact that 'Merthiolate' is used as a bacteriostatic agent in fluids for parenteral administration gives strong evidence of its safety.

660000

ELI LILLY AND COMPANY • INDIANAPOLIS 6, INDIANA, U.S.A.

Original Contributions

Amebiasis

J. ARNOLD BARGEN, M.D.
Rochester, Minnesota

THE experience of physicians who have dealt with intestinal problems during the last thirty years suggests that amebiasis has been the first diagnosis in many cases of intestinal conditions in which diarrhea is a prominent symptom. No one should underestimate the importance of accurate diagnosis and adequate care of the patient who has a bona fide infection with Entamoeba histolytica, but it has been rather easy, in considering a patient who had diarrhea, to think of amebiasis, give the patient some antiamebic therapy, and then, if improvement did not come, go more thoroughly into the examination to reach a more definitive diagnosis. This approach to the problem has been rather too prevalent and it should be decried. Every effort should be made in any given case of diarrhea to make an accurate diagnosis before undertaking therapy, because there are so many different types of intestinal disorders associated with this symptom and the treatment varies with the nature of the condition.

Surveys by physicians in different parts of the country indicate that amebiasis occurs in 5 to 10 per cent of the people of the United States. Some have suggested an incidence of 20 per cent but this is probably far too high. At one time amebiasis was considered a disease of the tropics or at least a disease of warm climates where sanitation was not satisfactory. However, the disease has been found universal in its distribution over the globe. This has been known for many years by physicians everywhere, and no longer is it thought that amebiasis occurs much more frequently in southern regions of the United States than it does in Minnesota. Consciousness of its presence in the people who pass through the office of the everyday practitioner of medicine is the factor of greatest importance toward its recognition. Control of water supplies, proper food handling, and elimination of insects that are transmitters of the causative agent constitute important steps in the eradication of this serious disease. Too frequently the corner grocery store may be the distributor of amebae. With our modern methods of transportation, fresh vegetables can be shipped almost everywhere at all times of the year. It is important then that we make sure of the way these vegetables were fertilized and that they be carefully washed before eating.

Serious as amebiasis may be, it is nevertheless unfortunate when a patient who does not have amebiasis is treated for it on a trial basis. For instance, if a patient who has ulcerative colitis is given an unusual amount of arsenic in the form of carbarsone or treparsol as a result of an erroneous diagnosis of amebiasis, he may fail to respond later to other more satisfactory measures of therapy. How serious amebiasis or amebic dysentery can be will be illustrated by a case which I shall report later.

Of much greater importance, however, is the case in which the patient is found to be infected with E. histolytica and takes some form of treatment, which eradicates enough of the amebae so that none are found in the stools, only to have the symptoms recur in a few months. Equally important is the case in which there is complete eradication of the amebae, and then the patient goes back to living in the same environment in which he lived before, only to become reinfected. Adequate methods of therapy are available for amebiasis, and complete relief from it is not difficult. The important problem is that of reinfec-

---

Read at the Postgraduate Seminar of the Mount Sinai Hospital of Greater Miami, Miami, Florida, May 18 to 21, 1955, and at the meeting of the San Diego County Medical Society, San Diego, California, September 13, 1955.

From the Section of Medicine, Mayo Clinic and Mayo Foundation. The Mayo Foundation, Rochester, Minnesota, is a part of the Graduate School of the University of Minnesota.

tion. This is particularly so among our neighbors across the border. At the Mayo Clinic we see many patients from the southern part of our hemisphere, many of whom carry E. histolytica without the amebae causing any symptoms. These patients apparently have become immune to the action of this parasite, and so the parasite lives in happy commensalism with his host. However, such a person may leave the parasite in Minnesota or California or Florida, and someone not adjusted to its activities may become infected and suffer a violent illness.

Cases of amebiasis occurring in this manner, as a fulminating or acute illness, are relatively uncommon but they are of sufficient importance and frequency that the practitioner of medicine should be constantly on the lookout for them.

The chronic form of amebiasis is of much greater importance than the acute form. It causes ill health, lowered vitality and decreased resistance to other infections. Chronic amebiasis seldom impels a patient suffering from it to visit his physician; and thus, perhaps, the physician does not have in mind the possible presence of the disease. However, these patients can and do transmit the disease. The infection is frequently water-borne and is due to poor sanitation, but it is also commonly transmitted by food, food handlers and insects.

During the surveys in various parts of the country, members of the personnel of hospitals have been found to be infected with amebae. This is a not unusual occurrence, and it brings home the point that persons working in hospitals, in and around the kitchen in particular, should be carefully examined to be sure that they do not carry any transmissible disease.

Incidence

Someone has observed that amebiasis exists where people exist, and this is probably a reasonably true statement. Craig and Faust[1] have estimated that 20 per cent of the people of the United States have amebiasis; that would mean more than 30,000,000 persons. As a matter of fact, only about 5,000 cases a year are reported. However, the true prevalence of amebiasis, as opposed to the reported prevalence, may reach figures as high as 80 or 90 per cent in some regions. Although amebiasis is commoner and more severe in tropical and subtropical regions than in temperate regions, its frequency is less dependent on geographical distribution than on the level of sanitation in a given locality. Epidemics of amebiasis are unusual, but they can occur as a result of gross contamination; witness the epidemic in Chicago in 1933. Frazier,[2] working in an institution in Ohio in which the population is 3,000 persons of retarded mental development, found 800 cases of infection by E. histolytica but made the diagnosis 2,000 times; in other words, there probably were infection and reinfection.

The importance of the problem of sanitation and cleanliness in regard to infestation by amebae is well illustrated by the following facts: Many authorities had predicted a great increase in amebiasis after World War II, in which our boys fought in the Pacific. However, McHardy[3] has called attention to the fact that this anticipated increase has not materialized. This is as one would expect, for in the United States, where sanitation facilities are at their best, reinfection by amebae should not take place and once the amebae are eradicated, the former hosts should not have the parasite again. Unfortunately, this is not always the case. McHardy has estimated the incidence in the United States as about 3.9 per cent, gathering his data from reports of members of the American Gastroenterological Association, from the departments of parasitology of various medical schools and from other sources.

Diagnostic Considerations

It must always be remembered that amebiasis is transmitted from hand to mouth. Persons with unclean habits should not touch food which others are to eat. Human manure should never be used for the fertilization of vegetables; however, it is still being used in some places. In this way, improperly prepared vegetables may transmit the trophozoites and cysts.

The trophozoites may be destroyed by the gastric secretions, but from an epidemiologic standpoint the cysts of E. histolytica are much more important than the trophozoites. It has been found that a patient who has acute symptoms may pass an average of 15,000,000 cysts daily, and these cysts may remain viable for days. An "ameba carrier" is in reality a person who has amebiasis that has not manifested severe enough symptoms to necessitate the attendance of a physician. The seriousness of an epidemic of amebiasis is comparable to that of an outbreak of smallpox, yellow fever, bubonic plague or other similar acute conditions. However, although epidemics of the diseases just mentioned usually create a panic and result in prompt and drastic measures to clear up the infection, an epidemic of amebiasis frequently may be dealt with rather lightly and allowed to have its own way.

Most persons who are hosts to E. histolytica seem to have some symptoms that may be ascribed to its presence. Much has been said about the "carrier state" of amebiasis, but recent studies by physicians from various parts of the world indicate that this term has been used too freely, with the resulting tendency not to take the presence of E. histolytica in carriers seriously enough. Albright and Gordon[4] stated that there is no such thing as a healthy carrier of amebiasis. In an editorial published in 1947[5] it was stated, "The carrier represents an active stage of the disease." The evidence concerning the inability of the parasites to live in the lumen of the bowel without producing lesions is rather conclusive. The aim of specific treatment is the eradication of all the parasites from the host.

Diagnosis

Frazier has suggested classification of persons infected with amebae into five categories: (1) the group in which the host is entirely asymptomatic and simply a carrier of E. histolytica; (2) the group in which symptoms are local or systemic without diarrhea but in which gaseous dyspepsia, anorexia, fatigability and other symptoms are prominent and the patient has amebae in the stools; (3) the same as group 2 except that the patients also have periodic diarrhea; (4) the group with classic amebic dysentery; (5) the group with complications. From the standpoint of diagnosis, such a classification may be helpful, but from a standpoint of treatment, not so much can be said, because symptomatic or not, all persons infected with E. histolytica should be treated.

General physical examination may not reveal anything of significance. Certain complications, however, such as hepatic abscess or pulmonary infection, may direct attention to the source of the trouble. Digital investigation of the rectum usually does not offer diagnostic data except when the disease is advanced, and then the ulcers cannot be distinguished from those of tuberculosis. The stiff, diffusely narrowed, tubelike rectum characteristic of thrombo-ulcerative colitis is not found in cases of amebiasis. Moreover, the rectal wall tends to be soft and pliable, like that of the normal rectum.

The absolute diagnosis of amebiasis is dependent on the finding of E. histolytica in the feces or other bodily discharges. It is important to adopt a standard procedure for preparing the patient for these examinations. It is best to collect the specimen near the laboratory, and it is well to have toilet facilities at hand.

The patient should be advised to have a free bowel movement about twelve hours preceding collection of the stool to be examined, and if he does not have diarrhea he is directed to take from ½ to 1 ounce (about 15 to 30 gm.) of magnesium sulfate on the morning of the examination and then to eat his usual breakfast.

Oily preparations and oily food should be avoided for at least forty-eight hours before the patient takes the salts. It is well to have the entire stool for examination; if it is formed, material should be taken from several places; if it contains patches of blood, pus or mucus, samples of these should be examined. Material from several portions of loose stools also should be selected.

The typical stool when the disease is acute is often reddish brown, and it may contain dark-brown streaks of mucus. Here and there will be flecks of bloody mucus. Charcot-Leyden crystals are frequently present. The stools of patients who have amebiasis do not contain the quantities of pus seen in the stools of those who have thrombo-ulcerative colitis. Although they may contain more blood than pus, rarely are the massive bloody discharges that are encountered in severe thrombo-ulcerative colitis seen in amebiasis.

The stools should be examined immediately, or at least within thirty minutes after passage, for motile vegetative forms of the ameba and also for cysts. Preparations for microscopic examination may be made by emulsifying a small portion of the stool in a drop of isotonic saline solution placed on a clean glass slide, or a weak solution (1:1,000) of water-soluble eosin may be used instead of saline solution. A coverglass is placed over the material on the slide to be examined. The emulsion should be homogeneous and thin. Strong solution of iodine U. S. P. (Lugol's solution), run under the coverglass or used to emulsify the feces, is helpful. It will aid in the observation of the nucleus of the motile ameba, in counting nuclei in cysts and in identifying the masses of glycogen.

The examination should be made in a warm room, and a desk light shining on the stage of the microscope may be used. The amebae are refractive, and the light entering the field should be such as to allow them to stand out sharply.

It is a good plan, if amebiasis is strongly suspected and amebae are not found on the first and second examinations, to examine at least three loose stools on as many consecutive days. The formed stool can be emulsified with isotonic sodium chloride solution and centrifuged at a moderate rate, and the sediment can then be examined to advantage.

Other methods of examination of stools, such as by permanently stained preparations and cultures, are technically cumbersome and not in general use, although they give good results in the hands of expert parasitologists.

Complement-fixation tests have come into use in some large laboratories. Until recently, they have been more experimental and confirmatory than of real practical value to the average physician. In 1948[6] it was stated that the complement-fixation test was still considered unreliable, that the incidence of errors was still too great and that it was not a substitute for examination of the stool.

It is generally agreed now that the complement-fixation test as performed at the National Institutes of Health, the Army Medical Center or the Communicable Disease Center almost always gives positive results in the presence of amebic hepatitis or amebic abscess of the liver and is a useful adjunct in the diagnosis of these extracolonic lesions.

Proctoscopic examination is a valuable aid to diagnosis. About a third of the patients who have active amebic dysentery have demonstrable amebic proctitis, but only slightly more than a tenth of the patients who are infected with E. histolytica have grossly visible ulcers in the rectum. The proctoscopic appearance of the rectal lesions, even when repeated examinations of the stools give negative results, often provides sufficient evidence for a positive diagnosis. Even when E. histolytica cannot be demonstrated in the stool, it may be found in great numbers in the scrapings taken from the bases of the ulcers.

In the general run of cases, the ulcers are discrete and the mucosa between them, although not normal, is so mildly inflamed as to seem relatively uninvolved. In many cases of severe diarrhea resulting from E. histolytica, the rectal and sigmoidal mucosa appears normal or only slightly hyperemic on proctoscopic examination. However, when the ulcers appear, they are typically discrete and do not have any characteristics that might lead to confusion with any other type of rectal ulcer, except certain types of tuberculous ulcers and, occasionally, those associated with the presence of Balantidium coli. The ulcers of amebic dysentery, even in its earliest stage, are not very large or very numerous; the large ulcers, which, it is believed, result from secondary infection, are not to be considered as a part of the characteristic picture.

The amebic ulcer usually appears on the prominent folds of the intestinal wall or involves the valves of Houston. The margins are undermined by infiltration of the ulcerative process, and prominence of the ulcer is increased further by accumulation of material on the base, composed largely of numbers of E. histolytica. This accumulation projects above the margin of the ulcer; it presents a grayish-white covering over the center of the ulcer. This grayish-white cap is easily swabbed away, after which the true base of the ulcer is revealed right below the surface of the overhanging margins. This is the explanation of the punched-out or umbilicated appearance of the amebic ulcer. An amebic ulcer may be as small as 2 to 3 mm. in diameter, or it may be large and sloughing and measure 2 to 3 cm. in diameter, or even more, with irregular margins and overhanging, ragged edges; the latter type usually is seen fairly high in the colon. The usual ulcer is about 3 to 8 mm. in diameter, and there is generally a small zone of hyperemia surrounding it. In cases of acute amebiasis, in which the patient suffers from severe prostration and passes an excessive number of stools and in which sloughing and bleeding are present, it is difficult to identify any ulcer; the involvement is massive and diffuse, and a single ulcer is seen only occasionally in the sloughing, bleeding mucosa.

Roentgenologic examinations, after a barium sulfate enema, of patients who have amebiasis are important. Usually results are negative, and the examination thus helps rule out other intestinal lesions. In experience at the Mayo Clinic, patients who present positive roentgenologic evidence of amebic colitis are rare; when such signs are present, they are usually in the cecum and ascending colon. The positive evidence of amebiasis obtained on roentgenologic examination of the colon usually consists of a deformity that, in general, resembles that of other chronic ulcerative diseases. The differential diagnosis is based principally on the distribution of the involved segments. Thus, in the roentgenologic examinations of some patients, extensive involvement by destructive disease is noted in the cecum, the ascending colon and the rectum. The rest of the colon may be roentgenologically normal. In the North Temperate Zone, ulceration of the colon of amebic origin is likely to be less severe and less extensive than that which is of tuberculous or streptococcic origin. In a few instances, however, a deformity involving most or all of the large intestine has been observed, which under treatment has disappeared almost entirely. When the deformity has been extensive, the regular, smooth, narrowed colon characteristic of chronic ulcerative colitis is not present, but, rather an irregular deformity is shown. The impression given, even in extensive disease, is that involvement is more mucosal than mural.

Complications

It must always be kept in mind that the presence of E. histolytica in the intestine may be associated with distant metastatic lesions or abscesses of various kinds. These include particularly abscesses of the liver, lungs and brain, but pericarditis, pleuritis, splenic and urogenital abscesses and cutaneous ulcers have also been found. In addition to the abscesses of the liver, which are usually single and are situated in the right lobe, a condition described as "amebic hepatitis" is recognized. Thus, not infrequently, a systemic disorder may call attention to the presence of amebae in the intestine. Occasionally, the only evidence of systemic disease is an unexplained fever, which may go unrecognized for a long time until someone examines the stools of the person with the fever.

Amebic granulomas have occasionally been mistaken for carcinoma of the rectum. A cursory examination with the finger and even by protoscopy has made it impossible to differentiate these conditions in an occasional case. Whenever there is any doubt, material for examination for parasites should be taken. Much commoner than this, however, is amebic hepatitis or local amebic abscess. The latter usually occurs in the right lobe of the liver. How serious the condition can become is illustrated by the following case:

> A man, aged forty years, working for a meat-packing company in Minnesota, who had been a serviceman in the Pacific in World War II, had had periodic diarrhea for quite a long time. However, he did not wish to report the condition to his superiors because he was allowed time off only for brucellosis and a few other infections and not for diarrhea. So he went on. However, following his death his co-workers complained that he frequently, when they were cutting a carcass, had to run for the toilet and did this fifteen to twenty times a day, so that his work was quite inefficient. He was brought to the clinic in extremis, with marked emaciation, exhaustion and shock, and died within twelve hours. Necropsy revealed a huge hepatic abscess, this time in the left lobe of the liver, perforation into the pericardium, and pericarditis, perforation into the left pleural cavity and amebae in all the fluids.

How easy it would have been to prevent this patient's death if he had reported his condition in time! This is only one illustration of failure of individuals to recognize the serious warnings and signs of an impending severe amebic condition.

Treatment

The difficulties in the problem of treatment have been largely referable to and caused by failures in diagnosis. A well-established program of therapy scrupulously followed, with avoidance of reinfection, will control nearly all cases of amebiasis. Because diagnosis has presented difficulties and many cases have gone undiagnosed for a long time, many investigators have tried new forms of therapy, always thinking that some new and better form of treatment will surpass those used before.

The efforts of therapy divide themselves into three main groups. All of them represent forms of chemotherapy, designed to annihilate the amebae or prevent their causing damage. The first includes some of the newer antibiotics. Among these, one can list aureomycin, terramycin, chloramphenicol, neomycin, bacitracin and fumagillin. The second group of drugs includes the various arsenicals, and the third a variety of therapeutic agents, such as PAA-701 (diallyldiethylaminomethylphenol dihydrochloride).

The antibiotics are not true amebicides, for they do not destroy amebae in vitro. The dose of these substances is similar to that used for other conditions.

A number of physicians with considerable experience in the treatment of amebiasis have come to the conclusion that fumagillin is at the present time the most satisfactory of the antibiotics. McHardy and Frye[7] have been giving it in doses of 30 to 60 mg. daily for ten days. This would mean a dose of 10 to 20 mg. three times a day. They have come to the conclusion that combined therapy of one antibiotic with another may be more efficacious than any of the antibiotics alone. Anderson,[8] Black, Terry and Spicknall,[9] and Malewitz[10] have had similar experiences with fumagillin. Armstrong and associates[11] have found terramycin to be an excellent antibiotic in acute dysenteries, but with relapses they add other amebicides. Their report is based on the results of treatment in fifty-one cases.

The arsenicals and oxyquinoline continue in favor among those who have had considerable experience in the treatment of amebiasis. Levy and Talley[12] have advocated the use of mercaptoarsenal, 10 to 20 mg. per kilogram of body weight, a maximum of 1 gm. daily being given for five days. Tucker[13] has advocated the use of bismuth glycolylarsanilate (milibis), chloroquine phosphate (aralen phosphate), 500 mg. of the former three times a day, 125 mg. of the latter twice a day. Two such courses can be given. Sanchez Vegas[14] has also advocated the use of these two agents as the most effective amebicides. Ritchie and Yokogawa[15] treated with carbarsone and chiniofon 241 inhabitants of a single Japanese village, where it was said that 10 per cent of the people were infected with amebae. Among 106 re-examined five weeks later, there was only one recurrence, and seven months later, only four recurrences.

Other drugs, such as resotren, mentioned by Halawani, Abdallah, El Kordy and Saif,[16] and PAA-701, mantomide, mentioned by Dennis and Berberian,[17] have found favor recently.

When all this information is added up, one finds that the results do not surpass a suitable program in which carbarsone, emetine and diiodohydroxyquinoline (diodoquin) are used in proper amounts at properly spaced intervals. One of the important problems in the treatment of complications is the treatment of amebic abscess in hepatitis. Chloroquine phosphate has become one of the leading drugs in the control of this. A paper by Radke,[18] published in 1954, indicates that patients with localized abscesses frequently complain of sharply localized hepatic pain. In Radke's group of fifteen patients, twelve had this complaint. At this point the tenderness is at its maximum. There is a sharp extension to the back and at times to the clavicle. In six of Radke's cases the latter occurred. The diaphragm was elevated in ten cases. Treatment of these patients included the use of quinacrine hydrochloride (atabrine), 0.1 gm. four times a day for 30 days, combined for the first ten days with carbarsone, 0.25 gm. twice a day for small men and for women and three times a day for large men. If the liver is still enlarged or tender at the end of thirty days, give quinacrine hydrochloride until the condition is cleared up.

Chloroquine phosphate has been a most important drug in the recent therapy of these cases. Chloroquine phosphate is prescribed in tablets of 200 mg. each. A course of one such tablet three times a day for five days seems to be superior to emetine, as indicated by Bhattacharya,[19] who treated fourteen patients in this way with excellent results. Patel[20] treated eleven patients who had liver abscess, giving 0.5 gm. a day for ten or twelve days with good results.

Dwork,[21] in reviewing the problem of recent therapy on amebiasis, concluded that the drugs of choice at this time are fumagillin, terramycin, aureomycin, bismuth glycolylarsanilate (milibis), diiodohydroxyquinoline (diodoquin) and iodochlorhydroxyquin (vioform). I am sure there are many who would take exception to this list, but this is just an illustration of how various men have used various drugs in the treatment of this rather intractable condition and have advocated the use of various drugs in accordance with their personal experience. Since no one has had a very large experience with any single one, it cannot be said, "These are the drugs of choice. These should be used preferably to any others." And yet any program that includes the satisfactory and carefully planned combination of emetine, an arsenical and an iodide will probably give us as good as or better results than all the newer forms of therapy.

Many of the recent therapeutic suggestions will undoubtedly be found to have great value in the ultimate complete eradication of E. histolytica from human hosts. However, it can be said that, in the main, even today few diseases respond so well to treatment when it is properly given as does acute amebic dysentery. However, eradication of the parasites, prevention of recurrence and combating of the numerous irregular relapses have often been difficult therapeutic problems. The purpose of treatment is threefold: (1) destruction of amebae in the tissue, (2) destruction of amebae in the lumen of the intestine and (3) healing of the ulcerative lesions.

I have assumed that spontaneous cure of amebiasis does not take place and that the portal of entry of E. histolytica is through the large intestine. For acute dysentery the following combination of drugs has proved eminently satisfactory: emetine hydrochloride, carbarsone or phenarsone sulfoxylate (aldarsone) and diiodohydroxyquinoline (diodoquin) or one of the oxyquinoline drugs with a high iodine content. The emetine hydrochloride is given hypodermically, the amount and manner of administration varying somewhat with the severity of the disease.

For severe attacks of amebic colitis, my colleagues and I give 1 grain (about 0.065 gm.) of emetine hydrochloride every twelve hours until 6 grains (about 0.4 gm.) have been given. For the moderately severe attack, 2/3 grain (about 0.043 gm.), given twice a day until 4 grains (about 0.26 gm.) have been given, suffices. It may be well to repeat such a course after an interval of a week. A warning must be expressed about the use of emetine. Effective doses are likely to prove toxic; doses a little greater than therapeutic amounts have been found to injure cardiac muscle, and the effectiveness of emetine alone against amebae is not great. However, emetine is an excellent adjunct to other drugs for the relief of acute symptoms. In the doses mentioned, and with a total amount of the drug of not more than 10 to 12 grains (about 0.65 to 0.78 gm.) administered to any one person, we have not encountered symptoms of toxicity. Emetine is less toxic for the liver than are other recommended drugs, and it gives quick symptomatic control, thus preparing the way for more curative drugs.

At the same time as the doses of emetine are begun, a 0.25-gm. capsule of carbarsone or phenarsone sulfoxylate is given three times a day until twelve capsules (3 gm.) have been given. If administration of emetine is to be started on a given day, the patient should start taking the arsenical that morning before breakfast. Thus, he will begin to take the arsenical twelve hours before taking emetine, and he will take his last dose of the arsenical twelve hours after the last dose of emetine. After administration of carbarsone is stopped, 0.25 to 0.5 gm. of diiodohydroxyquinoline is given three times a day for seven days. Then the whole course, including the emetine and the arsenical, should be repeated. Only an occasional person is sensitive to arsenicals and may have a reaction in the form of dermatitis, fever and vomiting and occasionally diarrhea; very occasionally, visual and acoustic disturbances have occurred. If any of these symptoms occur, administration of the drug should be stopped promptly and one of the oxyquinoline derivatives should be substituted. It has been our experience that satisfactory results in the treatment of amebiasis will be achieved if this routine is followed. We have come to the conclusion that persistent, adequate and properly timed administration of these drugs is the keystone of successful treatment. The proper combination of these drugs, given in rather large amounts over short periods and yet in amounts which are unlikely to produce toxic effects, has resulted in cure of most patients with amebiasis. Thus it is seen that a suitable and successful course of treatment in the average case of amebiasis covers 22 days.

It is to be hoped that the addition of such antibiotics as aureomycin and the use of chloroquine phosphate in some of the cases in which abscess of the liver is suspected may be important steps in the final control of amebiasis.

Comment

The ultimate solution of the problem of amebiasis may be distant, but Craig's[22] statement, that in order to diagnose 90 per cent of the cases a technician or physician should spend two years under competent instruction and during that time examine thirty to forty stools a day, is probably a most authoritative suggestion and advice for those who are interested in this problem. It points up the experience of so many, that the examination of the stools for E. histolytica is the job of an expert, someone who has had considerable experience in the examination of stools and in distinguishing between this parasite, other parasites and epithelial cells which resemble some of these organisms. Then, too, if the doubt remains and the patient's symptoms point to amebiasis, a therapeutic test with some of these drugs may be justifiable.

(References on Page 82)

Hormonal Treatment of Advanced Breast Cancer

E. A. REGNIER, M.D.
Minneapolis, Minnesota

THE subject matter of this paper concerns itself with a résumé of some clinical investigation which I have carried on in the past five years. I claim nothing new for the subject, but I believe its contents will reveal a new assessment of the value of the method and the results obtained. There is very little material in the recent literature on the subject and not much uniformity of opinion as to procedure and evaluation of results. Much needs to be done. Any form of treatment which is beneficial in the field of therapy in metastatic cancer of the breast deserves consideration.

The discovery by Beatson,[1] in 1896, that the ovary had a sustaining influence on breast cancer gave impetus to further study of this problem. He observed regression of two cases of cancer of the breast following oöphorectomy.

Lett[2] collected ninety-nine cases so treated and found marked improvement in 23 per cent and great benefit to another 15 per cent. This method of treatment fell into disfavor because of the added surgery and because of substitution of ovarian radiation, despite the fact that the latter method was slower and more uncertain in eliminating ovarian hormones.

Dr. Ira D. Nathanson[4] of Harvard University and his co-workers seem to have done the greatest amount of clinical investigation as regards the use of steroid hormones in the treatment of breast cancer.

The fact that castration alone has a beneficial effect on metastatic carcinoma of the breast and that estrogens and androgens likewise have beneficial effect seems rather paradoxical. Most authors agree, however, on the following points: In post-menopausal women, estrogens are superior to androgens in their objective favorable effect on the soft tissue manifestations of breast cancer. Contrariwise, androgens seem to yield a higher incidence of symptomatic relief with a relatively lower remission rate of the physical characteristics of the disease. The beneficial responses to androgens may occur in women of all ages but are usually more pronounced in the pre-menopausal era. As will be shown later, castration has an immediate beneficial effect on practically all cases of advanced breast cancer. In the pre-menopausal group, in fact up to the age of fifty-five, it is probably much safer to use just androgens because of the possibility of enhancing the growth of the carcinoma by treatment with estrogens. Most authors agree that after fifty to fifty-five years of age it is safe and probably best to use estrogen therapy. There is much evidence on the clinical results to show that estrogens and androgens exert their influences on breast cancer by somewhat different mechanisms. Androgens have a pronounced effect on bone metastases.

Nathanson noted that the pathological changes in the cancerous tissue after estrogen and androgen therapy resembled very much those following irradiation therapy. A gross observation of the primary tumor showed them to soften and some of the ulcerated areas to heal and the massive tumors to shrink very materially. He states that these same tissues showed microscopic changes similar to those seen after radiation therapy. He was also of the opinion that slow growing tumors seem to respond more satisfactorily to hormonal therapy. He further states that he was unable to determine from the histological studies whether the primary effect of steroids was on the cells or on the tumor bed. Tumors of low malignancy were the most responsive to various types of hormonal therapy. It is also generally agreed that hormonal therapy has both metabolic and hematological effects which are beneficial to the host.

This has been a difficult thing to explain because of the unknown methods of metabolizing steroids. Studies have been made on blood calcium and blood protein levels, on hemoglobin, red cell count readings and hematocrit readings, to-

---

Presented before the Minnesota Academy of Medicine, May 12, 1954.

gether with serum alkaline phosphotase tests, to learn more about steroid metabolism.

There is general agreement that the one common beneficial effect of treatment with hormones is the resulting sense of well-being. The uniformly elevated hemoglobins and rises in blood count suggest that the mechanism is either one of inhibiting the neoplastic cells in the bone marrow or it is one of stimulating the hematopoetic mechanism of the body directly. It is also known that hormones have a beneficial effect on protein metabolism in general. There is also the possibility that the major effects of estrogens are on the diseased cells directly, with secondary metabolic responses, and that the effect of androgens may be primarily metabolic in origin.

Nathanson[6] conjectures that the effect of androgens on protein formation may result from either stimulation of anabolism or the inhibition of catabolic processes and may be the deciding factor in the beneficial effect of this form of therapy. The fact that androgens are big factors in protein synthesis and osteogenesis must also be taken into consideration in interpretation of results. Tumor growth, therefore, may be handicapped by increased bone formation without direct effect on cancer cells. The mode of action therefore, of castration with use of estrogens and androgens is still very much unexplained. Nathanson states that it can be postulated under various circumstances that these three methods of treatment temporarily restore a substance that is hostile to the growth of cancer, or that these forms of therapy may help a natural defence reaction that in itself is not capable of reversing the course of the disease. In spite of the fact that there are so many unexplained answers in this method of therapy, it is encouraging to know that the tumor may be diverted from its anticipated course by essentially physiological processes stimulated by this form of therapy.

One can deduce that hormonal therapy is designed to alter the chemical environment of carcinoma cells dependent of hormones for their well-being. Sisson and Garland[7] mentioned that surgical castration or irradiation castration will bring about remission of metastatic lesions of bone and soft tissues in 20 to 25 per cent of the cases. Most authors feel that the percentage is closer to 50 per cent. Most authors agree that androgens should be used in treating patients under fifty-five years of age and estrogens used in the older group. Most people suffering from advanced breast carcinoma will respond to either androgens or estrogens and some people not doing well on one will improve on the other. Some authors alternate in the therapy, using both of these chemical drugs. Various doses have been suggested. The subcommittee of steroids and cancer therapy suggests doses of 150 mg. of testosterone weekly for a period of twelve weeks, minimal doses of estrogen to be 4 gm. and minimum length of treatment to be six months. Most authors agree that survival time of the patients treated for advanced cancer of the breast is increased after hormonal therapy. This is unproven statistically. The clinical course of the disease is more favorable.

Higgins and Dale[3] also suggests that the furtherance of this improvement, if hormonal therapy *per se* is not adequate, should be enhanced by adrenalectomy. This phase of therapy is not to be taken up at this discussion, however. Many authors feel that the use of hormone therapy should not be instituted until the patient has had failure from other methods of therapy, namely, radical surgery plus irradiation. The cases reported in this series are all cases having had surgery, some radical and some palliative plus irradiation of some form or other. The report of the council on pharmacy and chemistry in the *Journal of the American Medical Association* (June, 1951) gives the following results: The mean survival time of the patients treated with palliative irradiation was twelve months; with testosterone propionate, 7 5/10ths months; with estrogens, 7 6/10ths months to 13 3/10ths months. They conclude that some cancers are composed of cells of sufficient functional maturity that their activity and growth are retarded by removing the source of hormones supplying them. They also are of the opinion that immature cancers do not respond favorably to withdrawal of steroid hormones.

The twenty cases that I am reporting are chosen from some forty cases who had some form of hormone therapy, but only those cases which were well controlled and could be followed have been chosen. Some of them have not been under treatment long enough to warrant reporting on definite results. Therefore the twenty cases reported here are those that have been followed from one to five years and all of which have had adequate followup studies. As I stated before, these patients all had some type of operation, some of which was radical surgery and some of which was only palliative plus irradiation. This form of therapy was followed by hormone therapy as soon as evidence of recurrence of tumor in any portion of the body was evident. Length of treatment varied from six months to four years.

At the beginning of treatment we were more conservative in the dosages of medication given because of the inadequate information on what was the optimum dosage to be used. There is still no uniform opinion as to what constitutes an adequate dose, although the consensus seems to be that the 100 mg. of testosterone twice a week for a period of four to six months should be adequate and that a varied dose of estrogens from 15 mg. a day to 40 to 50 mg. a day for a period of six months should be adequate for estrogen therapy. During the past two years we have had to modify this dosage greatly because of our clinical observations. It has been evident from observing our patients that when 200 mg. per week were adequate for some people, this dose had to be doubled and tripled for others. It has also been our observation that a patient not doing well on this specified dose may improve greatly upon doubling the amount. This has been especially well demonstrated by some of the cases which are described below.

We have not selected cases for hormone therapy. All patients with metastatic carcinoma received either testosterone propionate or stilbestrol. We have used testosterone on patients under fifty years of age. They were all cases that had had x-ray studies of their bones and chest to determine whether or not they had metastases to the chest or to the osseous tissues. Serum calciums were studied on a few of these people but not universally done because we found no cases in which there were marked alterations in serum calciums under therapy. We evaluated the results of the treatment by noting regression of soft tissue lesions, regeneration of osseous lesions, relief of pain and evidences of improvement in general well-being such as weight gain, improved appetite, improved states of blood depletion and clearing of pleural effusion. Unfortunately we have also had the experience of seeing in one or two cases no regression whatsoever of the disease or possibly augmentation of the disease. The complications of therapy have been very few. True, there has been an occasional case of hirsutism, an occasional case of acne and some disturbances of the libido. This has not been marked or disturbing. Stilbesterol has been the drug of choice for estrogen therapy. We have had no cases of increased or severe uterine bleeding in the use of estrogens. One must also be cognizant of the possibility of electrolyte disturbances in these patients under intensive therapy.

Case Reports

Case 1.—This patient, Mrs. R., presented herself with a tumor of her right breast at age of thirty-eight. The tumor was biopsied and found to be malignant, and she had a radical breast operation November 30, 1946. The carcinoma was described by the pathologist as well differentiated adenocarcinoma, grade II, with negative axillary nodes. Her progress was very uneventful until June, 1950, when she began to develop abdominal distress. Within ten days of this time she developed some abdominal ascites and small nodules in her pelvis. Dr. Lang saw her in consultation at this time. At operation on June 7, 1950, an inoperable carcinoma of the ovary was found with generalized metastases covering the entire surface of the liver and peritoneum. At this time she was given deep x-ray therapy to the four pelvic fields. She received a total of 7,800 r of deep therapy to the pelvic fields. During all this period the patient had been absolutely free of any evidence of recurrence of the breast carcinoma, except for a small lesion which developed in the left breast which was about ½ cm. in diameter and very firm and very freely movable.

Because of the increasing abdominal fluid it was necessary to do abdominal paracentesis July 10, 1950, and August 5, 1950, where 6 to 8 quarts of fluid were removed from the abdominal cavity each time. Notes on her chart repeatedly recorded a small tumor in the left breast which remained unchanged. Because of the persistent ascites, it was necessary to again repeat the course of x-ray in June, 1951, where 8,700 r of radiation were given to the four pelvic fields. The patient's condition remained good. She was able to do her housework, and carry on through all this difficulty. On June 26, 1951, x-rays of her chest revealed a slight amount of pleural effusion on the left; 100 mg. of testosterone were given twice a week intramuscularly. This was the first evidence of metastatic carcinoma on her breast. This is rather significant insofar as she had survived a carcinoma of the ovary with generalized metastases throughout her abdomen. This should be most inimical to the inhibition of growth of a breast carcinoma because of the ovarian secretions. However, the ovaries had a tremendous amount of radiation and this may have kept the secretions in abeyance.

X-rays taken July 28, 1951, showed more fluid in the left chest than on previous examination; and the ribs, the sixth and the ninth on the left, and the eighth and ninth on the right, were now invaded by carcinomas. On September 1, 1951, the left pleural effusion showed marked increase and the rib lesions remained about stationary. One month later, x-rays of the ribs showed slight amount of healing, the patient having been on testosterone therapy ever since June of this same

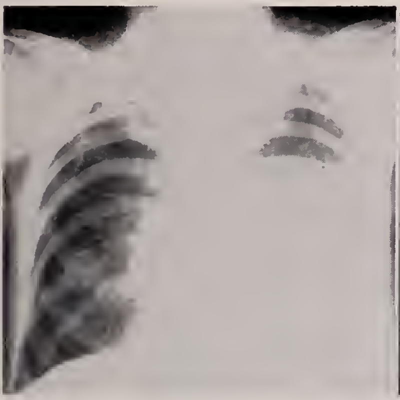


Fig. 1.

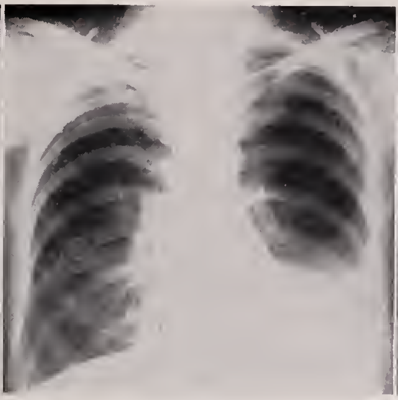


Fig. 2.

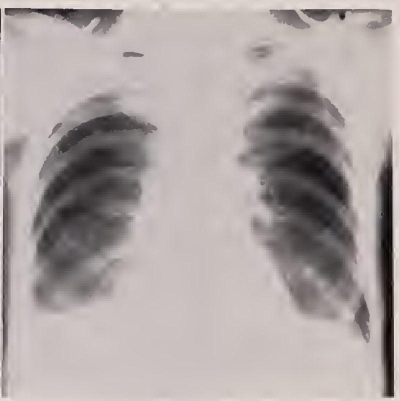


Fig. 3.

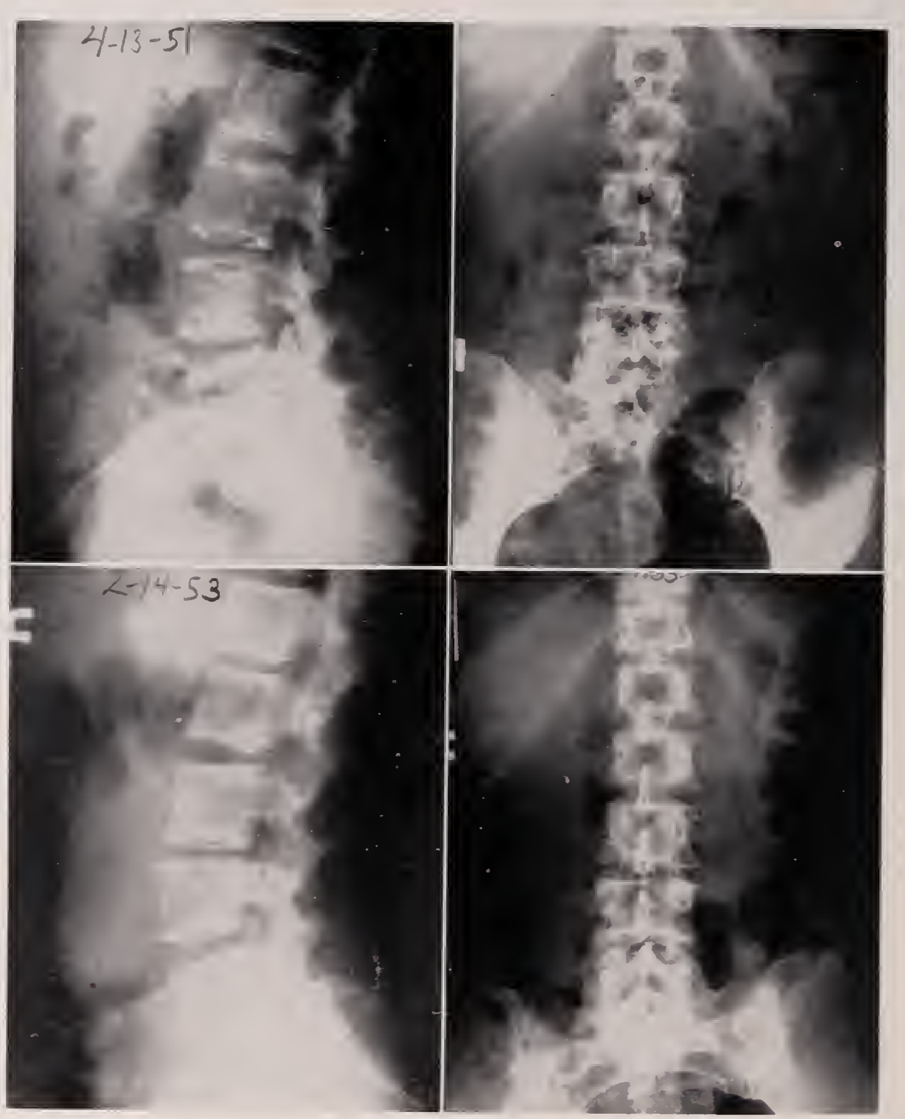
year, which meant that she had been on testosterone therapy for three months. At this time the fluid in the left chest remained about the same. On November 5 there appeared to be less fluid in the chest and the ribs showed some evidence of healing. Further x-rays taken January 12, 1952, showed some involvement of the glenoid fossa on the left and still evidence of metastases in the various ribs described above. Although there was now a slight pleural effusion at the right base with evidence of thickening of the right pleura, there was less effusion in the left base. X-rays of February 9, 1952, showed the bony lesions were now healing and both lung bases were beginning to clear. On April 5, 1952, the pleural cavities were clear, the lung fields were clear, the pleural thickening seemed to be decreased, there was no evidence of carcinomatous metastases in the chest at this time, and the bones showed more healing. On May 31, 1952, the lung fields were clear, the bony processes were stable, and the patient was absolutely comfortable, maintaining her weight, doing all her work but having ascites.

About this time the patient began rapidly accumulating ascites, but the pelvic examination revealed no increased evidence of carcinomatosis. However, in July she began to fail and the gastrointestinal studies showed that she had a high degree of intestinal obstruction at this time. This became more pronounced so that later she had to have an exploratory operation because of a complete bowel obstruction. This revealed involvement of all abdominal viscera in a carcinomatous covering which had matted all the viscera in a ball-like mass in the upper abdomen. The patient died a week later of the intestinal obstruction. It was impossible to relieve the obstruction surgically.

This case illustrates, I believe, in a classical manner the beneficial effects of androgen therapy in a relatively young woman who survived a carcinoma of the breast with surgery and no irradiation to the breast itself. She was given androgen therapy as soon as metastases developed and was able to carry on with most of her regular duties despite an intervening carcinoma of the ovary which ultimately caused her death. From November, 1946, until June, 1951, no demonstrable evidence of recurrence of breast carcinoma could be demonstrated except for the tumor of the left breast. However, she survived the breast carcinoma by approximately seven years; she survived the metastatic lesions of the breast carcinoma by thirteen months under androgen therapy, and she survived the combination of the two carcinomas, one by seven years and the other by over two years.

The evidence manifested by the films (Figs. 1, 2 and 3), I believe, speaks very strongly in favor of the fact that the only factors that sustained this woman throughout her metastases of breast carcinoma were the androgens she was taking. The fact that they show bony healing and the progressive healing of the chest lesions and the progressive disappearance of the effusion in both sides of the chest, I believe, is revealing. One can only conjecture what her expectancy might have been had she not suffered from the carcinoma of the ovary. X-rays show bony healing and regression of all chest fluid.

Case 2.—The second case that was indicative of the beneficial effect of androgen therapy was that of Mrs. H. This woman had a biopsy of a breast tumor done in Florida in 1948, when a simple mastectomy was done. In October, 1949, she presented herself with metastatic lesions in the axilla. A complete radical operation was then done, removing pectoral muscles and all the nodes in the axilla. This was diagnosed as adenocarcinoma, grade III, metastatic. This woman was put on testosterone therapy and was maintained on this therapy both by injections and by mouth in the form of linguets, a total dose of 30 mg. a day, and she was maintained in comfort on this form of therapy until April, 1951, when she developed a rather severe pain in her back and was brought to the hospital. At this time x-rays revealed that she had profound bony metastases of her ribs, spine and pelvis. The pain was so severe at this time that she was given a few x-ray treatments, simply to relieve her pain, and the doses of androgens were intensified to where she was getting 400 mg. a week for a while. This was cut down to 200 mg. a week, and she was maintained on intensive doses like this for a period of two years. In spite of the heavy doses, she had only slight voice changes and a slight amount of hirsutism but otherwise was free of symptoms. She remained well until September, 1953, when she became very ill and was hospitalized and a diagnosis of coronary thrombosis was made. A very short time after coming in to the hospital she died. An autopsy showed no evidence of active carcinomatosis anywhere in her body. The only demonstrable cancer consisted of four or five small nodules in the liver which were umbilicated and stationary.



Figs. 4. 5, 6 and 7.

From the appearance of x-rays taken at these two-year intervals (Figs. 4, 5, 6 and 7), I believe that the amount of bony healing shown, and the fact that she was free of symptoms, maintained her body weight, maintained her blood in good condition and carried on her regular duties in life until she was struck with the coronary thrombosis, is ample proof of the efficaciousness of this form of therapy. The films show changes under hormone therapy.

Case 3.—The third illustrative case is that of Mrs. M. J., age 58, a patient seen at the clinic at the General Hospital. This patient presented herself with a cystic tumor in the left breast. She was operated upon on October 29, 1948. The first time a simple mastectomy was done; a 5 cm. cyst, nonmalignant was reported. The patient remained well until December, 1950, when she noticed induration around the scar in the region of the operation of the left breast and some enlargement of the nodes in the left supraclavicular region. She went back to the hospital where a biopsy was done, and these lesions showed a scirrhous carcinoma. A 3 by 4 cm. mass was present in the right breast, with retraction of the right nipple and an orange-peel type of skin reaction. Chest x-rays at this time were negative. Laboratory work was all normal, and the patient was well otherwise except that she showed a hypertension of 200/100.

In July. 1951, that patient was given 15 mg. of stilbesterol three times a day. This was continued for four months when it was discontinued for a short time. During this interval the mass in the right breast showed a very definite shrinkage and nodules disappeared promptly over the left chest wall. She was seen by Dr. Stenstrom at the University, who advised against any x-ray therapy.

On July 30, 1951, x-rays were taken of her spine and these were normal. In August, 1951, she was again given stilbesterol, 35 mg. daily and was kept on this dosage for one month when the stilbesterol was increased to 40 mg. daily. While on the 40 mg. dosage, this patient's soft tissue lesions improved markedly. She felt well until February, 1952, and the nodule in the right breast remained smaller and stationary. Nodules began again to appear on the left chest wall. In June, 1952, it was noted that there were nodules in the right axillary space. This patient remained on 40 mg. of stilbesterol daily until November, 1952. At this time the nodules in the right breast and the right axilla were decreasing markedly in size. X-rays taken in August, 1952, showed the thoracic spine and lumbar spine to be involved with carcinomatous metastases. In January, 1953, the lungs and ribs showed questionable involvement by carcinoma. In April, 1953, there were carcinomatous nodules appearing in the lungs, ribs and the entire spine was involved. In September, 1953, x-rays showed more involvement of the ribs and across the clavicles. There was fluid in the right pleural cavity and there was further evidence of pulmonary metastases. In February, 1953, two nodules again appeared in the left chest wall. Notes made in April, 1953, showed that she was still on the same dosage of stilbesterol. The right breast and axillary nodes and skin lesions remained status quo and there were some supraclavicular nodes involved on the right. In August, 1953, this lady was put on 150 mg. of stilbesterol daily. Serum-calcium at this time was 9 mg. Serum phosphorus was 3 mg. In October, 1953, she began developing some fluid in the right chest. This was increasing slightly. Therefore the medication was changed to 200 mg. testosterone every two weeks. Serum calcium at this time had risen to 12.2 mg. On December 22 a note was made that the patient was markedly improved and generally felt better. In January, 1954, all the carcinomatous nodules were again regressing. In view of the improvement under testosterone therapy, in other words, in shifting from estrogens to androgens, it was decided to give this patient the minimum of 200 mg. a week, and she has been on this dose ever since that time and has continued to show marked improvement. The films (Figs. 8 and 9) show regression of chest fluid.

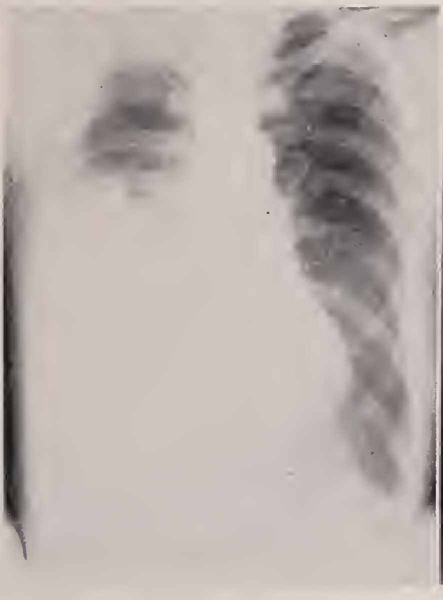


Fig. 8.

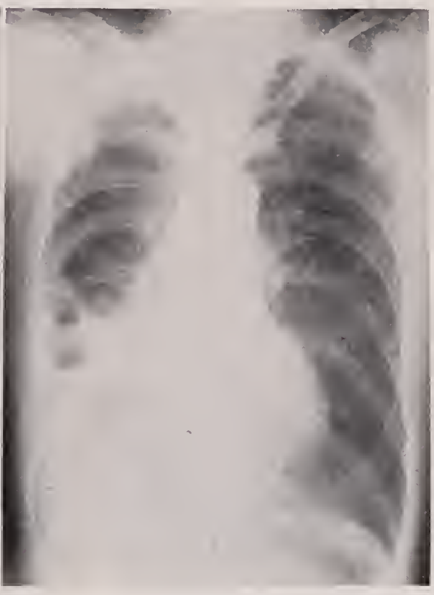


Fig. 9.

Conclusions

Any therapeutic procedure must prove its value to the patient. Uncomplicated procedures such as irradiation of ovaries plus the use of androgens and estrogens can be instituted by any physician.

I believe the evidence presented here justifies the conclusion that these measures are rational, safe, beneficial to the patient and prolong life in some cases beyond usual expectancy after generalized metastases have occurred (Table I).

These patients practically all improved subjectively though not always objectively. There is evidence here that cancer cells do not have the autonomous properties ascribed to them but are dependent on hormones for their growth.

We have positive evidence that the course of breast cancer may be retarded by the administration of sex hormones.

Further observation on the effect of hormones on breast cancer should help clarify their mode of action and help us solve the mode of cancer

TABLE I

Time elapsed from surgery to metastases:	Time elapsed from onset of metastases to death:
Average for group: 4 yrs. 4 mos.	Average: 19.6 mos.
Longest interval: 9 yrs.	Longest interval: 4 yrs.
Shortest interval: 1½ yrs.	Shortest interval: 6 mos.

Regression of soft tissue lesions:	Occurrence	Regression
Chest wall (local)	2	2
Lymph nodes	18	12+—
Lungs and pleura	6	3
Intracranial	1	1+—
Liver	8	2+—
Regeneration of bone	15	10+—
Evidence of subjective improvement:		
Pain relief	20	19
Weight gain	18	2
Appetite gain	18	
Blood maintenance and regeneration	15	+—

growth. A new form of therapy may provide a new approach to the study of cancer.

The response of breast cancer to hormonal therapy suggests that physiologic mechanisms for the control of cancer may be present in the body. A way of releasing this mechanism or stimulating it must be found.

There is ample evidence in the response to treatment of the cases cited above to justify the use of much larger doses of both estrogens and androgens than have previously been recommended.

Blood chemical studies and electrolyte balance must always be checked at first evidence of disturbance.

References

1. Beatson, G. T.: On the treatment of inoperable cancer of the breast. Lancet, 2:104-162 (July 11) 1896.
2. Lett, H.: An analysis of 99 cases of carcinoma of the breast treated by oophorectomy. Lancet, 1:227 (Jan.) 1905.
3. Higgins, Charles, and Dale, Thomas: J. A. M. A., 151:16 (April) 1953.
4. Nathanson, Ira T.: Hormonal alteration of advanced cancer of the breast. Bull. New England M. Center (Feb.) 1948.
5. Taylor, Samuel, and Morris, Roger D.: M. Clin. North America, 1951.
6. Nathanson, Ira T.: Clinical investigative experience with steroid hormones in breast cancer. Cancer 5: no. 4, 1952.
7. Sisson, Merrill, and Garland, L. H.: California Med., (Oct.) 1951.
8. Emerson, Wm. J.; Kennedy, B. J.; Graham, Jeanne N., and Nathanson, Ira T.: Cancer, 6:641-670, 1953.
9. Andrews, Robert, and Shafer, Irving: North Carolina M. J., 14:413-420, 1953.

AMEBIASIS

(Continued from Page 75)

References

1. Craig and Faust: Quoted by Frazier, R. L.[2]
2. Frazier, R. L.: Amebiasis: some fundamental aspects. M. Times, 81:261-267 (Apr.) 1953.
3. McHardy, Gordon: Incidence of amebiasis. Gastroenterology, 25:616-617 (Dec.) 1953.
4. Albright, E. C., and Gordon, E. S.: Present status of the problem of amebiasis. Arch. Int. Med., 79:253-271 (Mar.) 1947.
5. Editorial: The problem of amebiasis. J.A.M.A., 134:1095 (July 26) 1947.
6. Spellberg, M. A., and Zivin, Simon: Amebiasis in veterans of World War II with special emphasis on extra-intestinal complications, including a case of amebic cerebellar abscess. Gastroenterology, 10: 452-473 (Mar.) 1948.
7. McHardy, Gordon, and Frye, W. W.: Antibiotics in management of amebiasis. J.A.M.A., 154:646-651 (Feb. 20) 1954.
8. Anderson, H. H.: The use of fumagillin in amebiasis. Ann. New York Acad. Sc., 55:1118-1124 (Dec. 30) 1952.
9. Black, R. L.: Terry, L. L., and Spicknall, C. G.: Fumagillin in the treatment of amebiasis. Gastroenterology, 27:87-92 (July) 1954.
10. Malewitz, E. C.: Leukopenia following fumagillin treatment for amebiasis: report of a case. J.A.M.A., 153:1446 (Dec. 19) 1953.
11. Armstrong, T. G.; Wilmot, A. J., and Elsdondew, R.: Terramycin in treatment of amoebic dysentery. South African M. J., 26:766-768 (Sept. 20) 1952.
12. Levy, J. S., and Talley, R. W.: Effectiveness of balarsen (mercaptoarsenal) in treatment of amebiasis. Gastroenterology, 27:588-597 (Dec.) 1952.
13. Tucker, W. H.: Treatment and prognosis of amebiasis. J. M. A. Alabama, 22:231-235 (Mar.) 1953.
14. Sanchez Vegas, Julio: Evaluation of the newer amebacides. J.A.M.A., 151:1059-1065 (Mar. 28) 1953.
15. Ritchie, L. S., and Yokogawa, M.: Mass treatment of *Endamoeba histolytica* carriers. M. Bull. U. S. Army, Far East, 1:124-125 (June) 1953.
16. Halawani, A.; Abdallah, A.; El Kordy, M. I., and Saif, M.: Treatment of amoebiasis with resotren. J. Egyptian M. A., 36:747-761, 1953.
17. Dennis, E. W., and Berberian, D. A.: The chemotherapeutic properties of Win 5047 (mantomide): a new synthetic amebacide. Antibiotics & Chemother., 4:554-560 (May) 1954.
18. Radke, R. A.: Diagnosis and treatment of amebic liver abscess. Ann. Int. Med., 40:901-904 (May) 1954.
19. Bhattacharya, R. C.: Chloroquine in amoebic hepatitis (with a report of 14 cases). J. Indian M. A., 23:259-264 (Mar.) 1954.
20. Patel, J. C.: Chloroquine in the treatment of amoebic liver abscess. Brit. M. J., 1:811-813 (Apr. 11) 1953.
21. Dwork, K. G.: The drug of choice in amebiasis. Am. J. Gastroenterol., 22:152-157 (Aug.) 1954.
22. Craig: Quoted by Frazier, R. L.[2]

Problems in the Clinical Diagnosis and Classification of Ventricular Hypertrophy in Adults

II. Right Ventricular Hypertrophy

BEN SOMMERS, M.D.
Saint Paul, Minnesota

THE SECOND in this series of three papers dealing with diagnostic cardiac problems is devoted to a case of isolated right ventricular hypertrophy.

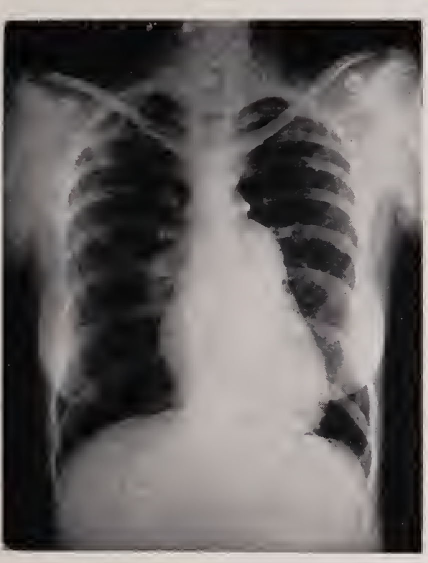


Fig. 1. Roentgenogram demonstrating right ventricular enlargement and prominence of the shadow of the pulmonary trunk.

Report of Case

A thirty-three-year-old white woman was seen in January, 1944, complaining of dyspnea and exertional pain in the thorax and arm. She had two children, aged three and one-half years, and one year. Both childbirths had been uneventful. Slight shortness of breath at night had begun when she returned home from the hospital after the birth of her younger child, and shortness of breath on exertion and angina had begun six months later. Hoarseness had been noted three months previously with a sinus infection but had persisted after the infection had disappeared. A thoracic roentgenogram taken in 1941 revealed no abnormalities, and the cardiac silhouette was normal.

Examination disclosed no cyanosis or clubbing of the fingers or toes. The only abnormalities found consisted of a soft systolic murmur along the left sternal border that was poorly transmitted and heard best in the fourth interspace, a snappy pulmonary second sound reduplicated on exercise, x-ray evidence of moderate right ventricular enlargement with a prominent shadow of the pulmonary trunk (Fig. 1) and electrocardiographic evidence of right ventricular strain (Fig. 2). The blood pressure was 108/78. The sedimentation rate was 61 mm. in one hour (Westergren). Results of the Kline test were negative.

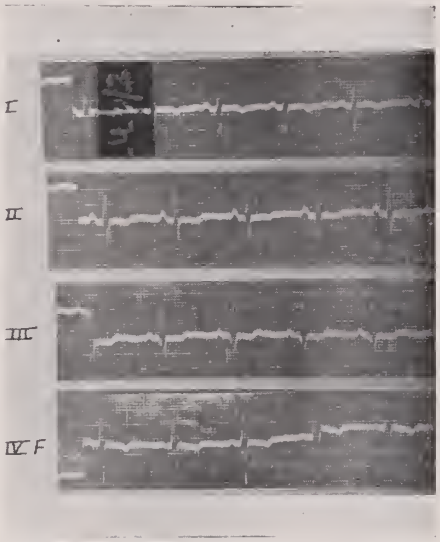


Fig. 2. Electrocardiographic evidence of right ventricular strain.

Dr. George Fahr saw this patient in February, 1944, and concurred in the diagnosis of an interventricular septal defect.

On supportive therapy, including digitalis, the patient was fairly comfortable until March, 1944, when pericarditis developed, with a septic temperature, a loud dry friction rub, thoracic pain and a sedimentation rate

---

From the Charles T. Miller Hospital, Saint Paul, and the University of Minnesota, Minneapolis, Minnesota.

Part II of thesis submitted for admission to the Minnesota Academy of Medicine, April, 1954.

of 73 mm. She was hospitalized because of a suspicion of subacute bacterial endocarditis but repeated blood cultures remained sterile and splenomegaly and petechiae did not develop. Antibiotics were not given. At dismissal in June, 1944, the sedimentation rate was still elevated (43 mm.), but the pain and fever had abated. However, electrocardiographic studies revealed progressive right ventricular strain.

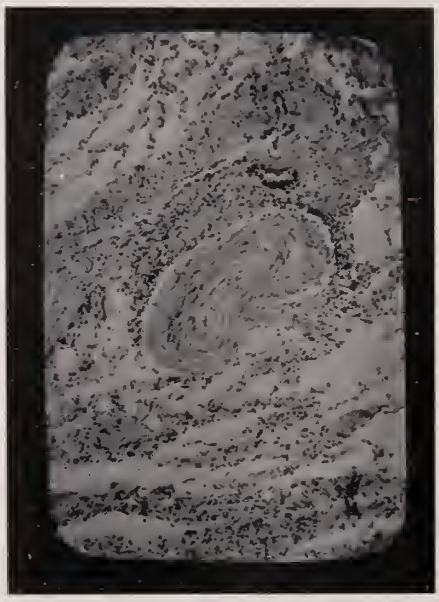


Fig. 3. Low-power magnification of section of lung, showing fibrous intimal thickening of a large muscular artery.

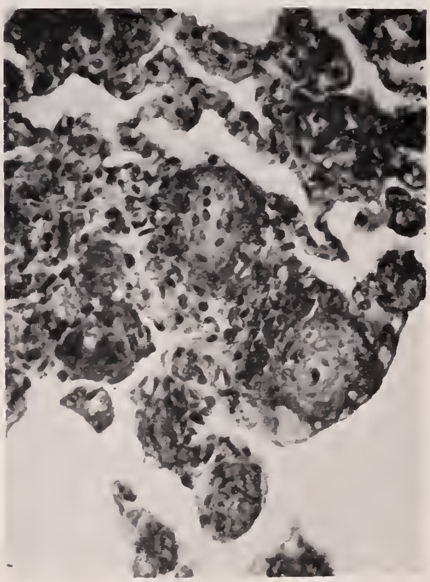


Fig. 5. High-power magnification. Fibrous intimal occlusion of small muscular arteries of lung (Verhoeff's stain).

In July, 1944, a pericardial friction rub, accompanied by fever and thoracic pain, recurred for two days. In early August, progressively severe right heart failure developed, with abdominal distention, hepatomegaly and edema in the sacral region. A blood culture at this time was sterile. Death occurred in August, 1944, approximately nineteen months after onset of symptoms.

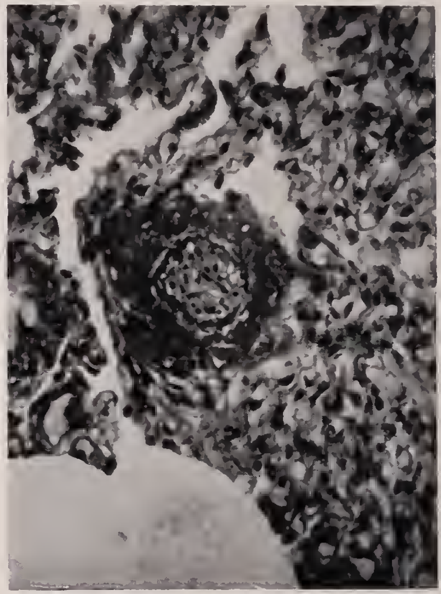


Fig. 4. High-power magnification of section of lung showing medial hypertrophy of a large muscular artery (Verhoeff's stain).

Necropsy was done by Dr. Kano Ikeda. The pericardial sac contained 60 cc. of clear, serous fluid. The heart weighed 400 gms. A few fibrous adhesions were present at the root of the pulmonary artery; otherwise the epicardium was smooth. The myocardial color was not remarkable. The left ventricle was slightly hypertrophied. The right ventricle and auricle were enormously hypertrophied and dilated. The myocardium was fairly firm. The mural endocardium was smooth, and the valves showed no disease. The root of the aorta presented a smooth intimal surface. The coronary arteries were patent and appeared normal.

Grossly, the lungs appeared normal except for slight atelectasis in the dependent portions. The bronchi, pulmonary veins and pulmonary arteries were normal. There was chronic passive congestion of the liver and kidneys.

Microscopic sections of the myocardium were not remarkable. Microscopic sections of the lungs were considered to be within normal limits at that time, showing very minimal sclerotic changes in the smaller bronchial arteries.

Comment

On restudy of this case in 1953 and 1954, these sections were sent to Dr. Jesse E. Edwards, at the Mayo Clinic, for his opinion. At his request, elastic-tissue stains were made. His report follows:

> "Two processes exist. One is characterized by medial hypertrophy of the large muscular arteries; the other process consists of fibrous narrowing or occlusion of vessels in the arteriolar and small muscular arterial classes. The latter change, that is, the fibrous intimal thickening, at times has a honeycombed effect resembling organized thrombus. There is, in addition, occasional fibrous intimal thickening of the large muscular arteries. Also, there is an occasional elastic artery showing lipoid deposition in its intima associated with a fibrous proliferation, a picture to be classed as atherosclerosis."

The histologic findings are pictured in Figures 3, 4 and 5.

In 1944, cardiac catheterization had not been performed in Minnesota. The vascular changes in the lungs in this case were, however, similar to those seen in patients whose pulmonary-artery pressures have been measured and found to be elevated during life. This type of case has been called by some "primary pulmonary hypertension" and by others "pulmonary hypertension resulting from occlusion of pulmonary vessels by thrombi or emboli." Consideration of the etiology of this type of disease is beyond the scope of this paper, but the reader is referred to papers by Brenner[1] and by Dresdale and co-workers.[2] The extensive pathologic and clinical investigations of Edwards and his associates[3-11] have failed to convince him that pulmonary hypertension occurs as a primary condition.

This case, although clinically a problem as to the cause of the right ventricular hypertrophy, may now be considered an example of right ventricular hypertrophy associated with pulmonary hypertension. It is well to emphasize that, before right ventricular hypertrophy is considered idiopathic, various categories of disease known to be associated with right ventricular hypertrophy must be ruled out by necropsy. These conditions, according to Edwards,[10] include (1) impaired pulmonary venous flow, (2) disproportion between pulmonary blood flow and the capacity of the pulmonary bed and (3) common ventricular ejectile force for both the systemic and the lesser circulations in the absence of pulmonary stenosis. Edwards listed twenty-two separate conditions under these three categories, with many subdivisions. Unfortunately, many of these conditions are easily overlooked at necropsy.

Of special interest in this case was the apparent minority of pulmonary arteries involved. The small amount of tissue removed for sections may be part of the difficulty, a better method of study probably being injection of the pulmonary arteries with radiopaque material similar to the Schlesinger technique for studies of the coronary arteries.

The pathologic diagnosis of thrombotic or embolic pulmonary vascular disease in this case is well supported by the clinical history and course. Symptoms began immediately after a pregnancy and were preceded by a normal chest film two years earlier. Still unexplained, however, were the two attacks of pericarditis and their substantiation, however scanty the evidence, at necropsy.

In 1946, Castleman and Bland[12] described organized emboli of the tertiary pulmonary arteries as an unusual cause of cor pulmonale. A forty-four-year-old housewife survived for nine years with cor pulmonale after pregnancies at thirty-one, thirty-three and thirty-five years of age and a pelvic operation at twenty-nine. Pelvic thrombi during pregnancies or following the pelvic operation were believed to be the source of her emboli.

Muirhead and associates[13] reported another case following pregnancy and one associated with cryoglobulinemia. Similar cases associated with pregnancy or with transfusion of blood contaminated by cotton fibers and by other foreign bodies, and the experimental production of pulmonary sclerosis in rabbits by means of intravenously administered human fibrinous blood clots, Lycopodium spores, amniotic fluid and autogenous blood clots, attest to the interest shown in this condition of late years.

In reviewing the literature on idiopathic right ventricular hypertrophy[14-19] and earlier publications on pulmonary arteriosclerosis[20-23] one cannot help wondering whether one or more of the afore-mentioned conditions listed by Edwards was not overlooked in many of these recorded cases. The three cases of Dresdale and associates[2] classified as primary pulmonary hypertension, and encountered in a two-year period in a 500-bed general hospital were all in women who were twenty-five, thirty-five and thirty-three years of age. The second case, the only one in which necropsy was done, showed pulmonary sclerosis in both small and larger branches, with thrombi. Thrombo-embolism associated with pregnancy might have been the causative factor in one or more of these cases, as well as in the three young women reported on by East.[14] Amniotic-fluid embolism has been reported in several cases but this substance acts as a foreign body and may be removed with passage of time, leaving thrombi in various stages of canalization.

Summary and Conclusions

A case of right ventricular hypertrophy, considered to be idiopathic after clinical and necropsy study but shown by more recent pathologic investigation to be due to thromboembolic pulmonary vascular disease associated with pregnancy, has been reported. A brief review of this subject is included, with a brief outline of the subject of primary and secondary pulmonary hypertension.

Until the numerous causes of pulmonary hypertension have been ruled out, some of which are easily overlooked, it is perhaps well to remain skeptical of the existence of primary pulmonary hypertension. Meanwhile, the antemortem diagnosis of this condition does not seem justified.

References

1. Brenner, O.: Pathology of the vessels of the pulmonary circulation. Arch. Int. Med., 56:976-1014; 1189-1241, 1935.
2. Dresdale, D. T., Schultz, Martin, and Michton, R. J.: Primary pulmonary hypertension. Am. J. Med., 11:686, 1951.
3. Edwards, J. E.: Structural changes of the pulmonary vascular bed and their functional significance in congenital cardiac disease. Proc. Inst. Med., Chicago, 18:134, 1950.
4. Edwards, J. E., Douglas, J. M., Burchell, H. B., and Christensen, N. A.: Am. Heart J., 38:205, 1949.
5. Civin, W. H., and Edwards, J. E.: Pathology of the pulmonary vascular tree. I. A comparison of the intrapulmonary arteries in the Eisenmenger complex and stenosis of ostium infundibuli associated with biventricular origin of the aorta. Circulation, 2:545, 1950.
6. Becker, D. L., Burchell, H. B., and Edwards, J. E.: Pathology of the pulmonary vascular tree. II. The occurrence in mitral insufficiency of occlusive pulmonary vascular lesions. Circulation, 3:230, 1951.
7. Edwards, J. E., and Chamberlin, W. B.: Pathology of the pulmonary vascular tree. III. The structure of the intrapulmonary arteries in cor triloculare biatriatum with subaortic stenosis. Circiulation, 3: 524, 1951.
8. Civin, W. H., and Edwards, J. E.: The postnatal structural changes in the intrapulmonary arteries and arterioles. Arch. Path., 51:192, 1951.
9. Edwards, J. E., and Burchell, H. B.: Differential diagnosis of mitral stenosis: A clinicopathologic review of simulating conditions. J. Lab. Investig. (in press)
10. Edwards, J. E.: Pathology of pulmonary hypertension. Proc. of Postgrad. Cardiovascular Seminar, Florida Heart A., pp. 121-126, 1952.
11. Edwards, J. E., and Burchell, H. B.: Multilobar pulmonary venous obstruction with pulmonary hypertension. "Proctective" arterial lesions in the involved lobes. AMA Arch. Int. Med., 87:372, 1951.
12. Castleman, Benjamin, and Bland, E. F.: Organized emboli of the tertiary pulmonary arteries—an unusual cause of cor pulmonale. Arch. Path., 45:581, 1946.
13. Muirhead, E. E., Montgomery, P. O., and Gordon, C. E.: Thromboembolic pulmonary vascular sclerosis. Report of a case following pregnancy and of a case associated with Cryoglobulinemia. AMA Arch. Int. Med., 89:41, 1952.
14. East, Terence.: Pulmonary hypertension. Brit. Heart J., 2:189, 1940.
15. De Navasquez, S., Forbes, J. R., and Holling, H. E.: Right ventricular hypertrophy of unknown origin, so-called pulmonary hypertension. Brit. Heart J., 2:177, 1940.
16. Raaschow, F., and Samuelson, S.: Isolated hypertrophy of the right ventricle of the heart of unknown cause. Acta Med. Scandinav., Suppl., 130: 206, 102, 1946.
17. Wittenberg, S. J.: Primary, pulmonary hypertension. Reported in the Clinical Society Conference of the Beth-David Hospital in New York, April 10, 1950.
18. Wood, P.: Congenital heart disease. A review of its clinical aspects in the light of experience gained by means of modern techniques. Brit. M. J., 2:639, 1950.
19. Chapman, Don W., Earle D. M., Guyle, L. J., Huggins, R. A., and Zindahl, W.: Intravenous catheterization of the heart in suspected congenital heart disease. Arch. Int. Med., 84:644, 1949.
20. MacCallum W. G.: Obliterative pulmonary arteriosclerosis. Bull. Johns Hopkins Hosp., 49:37, 1931.
21. Ljungdahl, M.: Untersuchung über die Arteriosklerose des Kleinen Kreislaufs. Wiesbaden: J. F. Bergmann, 1915.
22. Ulrich, H. L.: The clinical diagnosis of pulmonary arteriosclerosis. Ann. Int. Med., 6:632, 1932.
23. Kaump, D. H., and Dry, J. J.: Pulmonary arteriolarsclerosis. Arch. Int. Med., 61:1, 1938.
24. Edwards, J. E.: Personal communication.

CARDIAC OPTIMISM

Instilling a hopeful outlook is the most important thing a physician can do to assist a victim of coronary thrombosis to return to normal life. And such optimism is fully justified for most heart patients, according to Dr. Paul Douglas White of Boston, noted cardiologist recently called into consultation on President Eisenhower. Even in cases of severe heart damage requiring long convalescence, "the resumption of work is usually possible, although the occupation may need to be changed if it is too strenuous." And with the pace of present research, "there may be something just around the corner that may prove helpful to some who at present seem hopelessly ill.

"Thought of this possibility may actually aid in prolonging the life of some patients sufficiently to take advantage of new discoveries when they come," for "idleness breeds unhappiness and is actually bad for the health. It is a rare patient who is fit for nothing."—P. D. White: Medigrams, *GP*, 12:89 (Dec.) 1955.

The Use of Blood and Plasma Expanders during the Third Trimester of Pregnancy

THOMAS H. SELDON, M.D.
Rochester, Minnesota

IN the event of a major obstetric emergency, necessitating vigorous supportive therapy during the third trimester of pregnancy, the intravenous administration of a blood-volume expander, blood plasma or whole blood may be a lifesaving measure. Two examples of such emergencies are those caused by placenta previa and abruptio placentae. Both of these emergencies may result in considerable loss of blood with possibly a marked deleterious effect on the well-being of the mother, as well as the expected baby. Not infrequently, everyone practicing obstetrics may be faced with such an emergency with severe loss of blood and, at the same time, be unable to move the patient to a hospital before supportive treatment must be instituted.

The importance of whole-blood transfusion in the treatment of shock accompanying these two conditions goes without question. There is no substitute for hemoglobin and erythrocytes. The use of plasma-volume expanders is of real value at times, but it never was intended to supplant the transfusion of whole blood. However, the usefulness of plasma-volume expanders results from the low cost of manufacture, the ease of storage for long periods, and their effectiveness in emergency treatment of loss of blood volume and shock. Most of these products can be transported easily and may be administered in homes, ambulances or the emergency admitting ward of a hospital.

Of all the plasma-volume expanders currently available, dextran, polyvinylpyrrolidone and gelatin appear to meet most of the criteria required of an acceptable product. The ideal one has not been discovered.

The plasma-volume expanders appear to be of greatest use when the loss of blood does not exceed 20 per cent of the total blood volume. When more than 35 per cent of the total blood volume has been lost, the anemia commands attention. Therefore, transfusions of whole blood, with or without the use of plasma-volume expanders, are indicated.

Dextran

Solutions of dextran in this country are available under various trade names. The chemical nature and the molecular form, size and shape of the dextrans have been studied. Use of a 6 per cent solution has been effective in restoring blood volume and in improving blood pressure. Pulaski[1] stated that after injection of dextran tagged with C^{14} into the dog, the urine shows 65 to 70 per cent of the radioactivity, with 4 to 6 per cent in the expired carbon dioxide and 3 to 5 per cent in the viscera at the end of seventy-four hours. About 25 per cent cannot be found. Material marked with C^{14} also was found in the liver, spleen and lymph nodes.

Part of the retained dextran is metabolized. Michie and Ragni[2] found no clear evidence of renal damage, although depression of tubular function has been noted.

Polyvinylpyrrolidone

Polyvinylpyrrolidone (PVP) is a synthetic macromolecular polymer first produced in Germany early in World War II. The raw materials used in its production are ammonia, acetylene and formaldehyde. In a concentration of 3.5 per cent in isotonic solution of sodium chloride, with a molecular weight of 40,000, this substance has a desirable colloidal osmotic pressure and viscosity. There is no evidence that this product is metabolized. Forty per cent appears in the urine in the first twenty-four hours. At the end of seventy-two hours, 28 per cent is still unaccounted for, as far as excretion in the blood or the urine is con-

---

From the Section of Anesthesiology and Intravenous Therapy, Mayo Clinic and Mayo Foundation, Rochester, Minnesota.

Read at the meeting of the Minnesota Obstetrical and Gynecological Society, Duluth, Minnesota, April 30, 1955.

The Mayo Foundation is a part of the Graduate School of the University of Minnesota.

cerned. In the mouse this product is stored in the endothelial cells of blood vessels, the reticuloendothelial cells, the liver and the kidney.

Gelatin

Solutions of gelatin have been used for several years. A 6 per cent solution has about the same osmotic pressure as is exerted by plasma. Particles of a molecular weight of less than 30,000 are excreted in the urine. Four hours after infusion of a 5 per cent solution of gelatin, Jacobson and Smyth[3] found that 70 per cent was still retained in the blood. Fifty per cent of the particles of a molecular weight of more than 30,000 to 35,000 are reported to be retained for twenty-four hours. This product has been used satisfactorily for treatment of patients suffering from shock. Changes in tissue produced by gelatin consist of transient swelling of the tubular epithelium of the kidney and temporary storage in the liver and reticuloendothelial system.

The use and value of whole-blood transfusion in some conditions will be referred to later in this presentation.

Emergency Measures

During the delivery of the baby, emergencies requiring supportive therapy may arise from severe bleeding, from lacerations, from postpartum atony and from retained secundines. An unusual happening, postpartum inversion of the uterus, may result in severe shock, necessitating the emergency administration of plasma-volume expanders or of whole blood.

An emergency transfusion of blood may be started with cross-matched compatible blood, using low-titer group O Rh-negative blood, if the patient is in the hospital and if his group is unknown and if sufficient time is not available for determining the group and Rh type of his blood.

In so far as possible, it is advisable to administer cross-matched blood of the same group and Rh classification as that of the patient, instead of un-cross-matched group O Rh-negative donor blood. However, if the emergency demands speedy administration of blood, low-titer group O Rh-negative donor blood may be used.

In the institution with which I am associated, blood is collected in 500-cc. vacuum bottles containing anticoagulant acid citrate dextrose solution. Disposable sets for intravenous administration are used. Fifteen-gauge or 18-gauge needles are introduced into accessible veins. Infiltration with a local anesthetic at the site of venipuncture makes the procedure more comfortable for the patient.

The rapid administration of a large quantity of whole blood sometimes is necessary. One of the commercial distributors has an administration set made of one of the plastic materials which can be used for forceful introduction of blood into the patient's veins. Another technique used not infrequently is to introduce air into the vacuum bottle and create within the bottle a positive pressure that is sufficiently high to force the donor blood into the patient's venous circulation.

It is very desirable for all physicians to be aware of the fundamental principles of this subject of emergency blood transfusion. For this procedure to be carried out satisfactorily, it is important for the physician to be able to introduce needles into veins without discomfort or trauma to the patient. Too frequently, interns, residents and others have had little or no instruction in the technique of venipuncture. It behooves all of us to teach interns and residents all the many tricks that go to make a successful venipuncture. This instruction is invaluable when emergencies arise that necessitate the intravenous introduction of fluids or whole blood for needed supportive therapy.

References

1. Pulaski, E. J.: Quoted by Hartman, F. W. and Behrmann, Vivian G.: The present status of plasma expanders. J.A.M.A., 152:1116-1120 (July 18) 1953.
2. Michie, A. J. and Ragni, M. C.: The effects of Dextran on kidney function. Report to the Subcommittee on Shock. National Research Council, July, November, 1951.
3. Jacobson, S. D. and Smyth, C. J.: A comparative study of the effects of human plasma, physiologic saline, pectin, and gelatin (4 per cent and 5 per cent) on the plasma volume in man. Proc. Central Soc. Clin. Res., 17:45-46 (Nov.) 1944.

Why Not Pack the Postpartum Uterus?

JACK R. PIERCE, M.D.
Virginia, Minnesota
EDWARD G. WINKLER, M.D.
Buffalo, New York

THIS paper is devoted to a consideration of hemorrhage from the postpartum uterus due to atony. Bleeding due to lacerations or retained secundines are not considered, unless atony was also part of the clinical picture.

Recently, statements have been made by some rather prominent obstetricians to the effect that they did not believe in packing a postpartum uterus, or that they never had packed, or that they never would. In one instance, the obstetrician making this statement was also reporting several hysterectomies done post partum because of uterine atony.

There have been very few statements by the proponents of packing. Many good obstetricians pack the atonic, bleeding uterus. We feel that it is a good procedure. To us, it is inconceivable that hysterectomy should be done for postpartum atonic bleeding, without first having properly packed the uterus.

Some statistics are presented in Table I which support our contention that packing is a good procedure. These statistics were collected from the Edward J. Meyer Memorial Hospital and the Buffalo Hospital of Sisters of Charity, Buffalo, New York, and from the Virginia Municipal Hospital, Virginia, Minnesota. They cover all deliveries in the past six years in the first two hospitals mentioned, and all deliveries in the past twelve years in the last mentioned hospital. These are consecutive deliveries. No cases have been deleted for any reason. During the periods mentioned, there were 38,403 deliveries in these institutions; 505 cases had postpartum packing of the uterus because of atonic bleeding. There was one hysterectomy for postpartum atony. In this case, the uterus was not packed. The patient was under the care of a physician who apparently did not subscribe to the procedure of packing. There was no mortality due to postpartum atonic hemorrhage in this series. There were no serious complications in the patients who were packed. Besides the intrauterine pack, we also use the prescribed methods of uterine massage, intravenous Pitocin, ergonovine and blood transfusions. We may have employed the pack somewhat more often than absolutely necessary. Since none of these women died of postpartum hemorrhage or lost her uterus, we feel that this is not a serious fault.

TABLE I. POSTPARTUM ATONIC BLEEDING IN 38,403 DELIVERIES

Hospital	Deliveries	Packed for Bleeding	Hysterectomies-Atonic Bleeding	Mortality
Edward J. Meyer Memorial	6,309	179	0	0
Sisters of Charity	22,618	310	0	0
Virginia Municipal Hospital	9,476	16	1*	0
Total	38,403	505	1	0

*This patient was not packed, by the physician's choice. Actually, no hysterectomies were performed among those patients packed.

The physiology of postpartum uterine atony is not well understood. There are several questions which must be answered by any physiological explanations of atony. (1) Why does a uterus which has gone through a normal first, second and third stage of labor suddenly become atonic in the fourth stage? (2) Why does a uterus which has gone through an abnormal, inertia-type of first, second and third stage of labor have a normal fourth stage?

Certain terminology should be understood before considering atony. By *contraction,* we mean the act of muscle shortening. By *retraction,* we refer to the relaxation phase between contractions. During this relaxation phase, however, the muscle does not return completely to its original length. Eastman[1] states that retraction is the ability of a muscular viscus to contract down on its decreasing contents with the tension remaining constant.

Where does postpartum bleeding come from? Usually, it is from the large sinuses at the site of

---

Presented at a meeting of the Minnesota Obstetrical and Gynecological Society, April 30, 1955.

the placental implantation. How is postpartum bleeding normally controlled? Contractions of the various muscle fibers, by compressing and twisting the sinuses, staunch the flow of blood temporarily during the contraction. If retraction is adequate, even in the relaxation phase between contractions, there is enough compression and kinking of the sinuses to prevent a heavy flow. Finally, thrombosis and fibrosis control the bleeding permanently. It follows that in order to retract, the muscle must first contract. A uterus which can do neither, probably must come out. We have not seen such a uterus.

People who do not use packs have given many reasons for their ineffectiveness: packs prevent contraction; prevent retraction; cause infection; and merely soak up blood. In answer to these objections, we can state that our packs, when removed, are practically never blood-soaked; they are wet with a serous pink fluid. We have had no serious morbidity. Basic physiology teaches that increasing the tension in a hollow viscus increases the contractibility of the viscus. Reynolds, Kaiser and Harris[2] state that the contractibility and retractibility of the uterus are dependent upon the radius of curvature of each individual muscle fiber and the amount of intrauterine tension.

We believe that a uterus which is contracting and retracting enough to cause delivery of a fetus and placenta does not suddenly, totally, lose the ability to contract and retract. The delivery of fetus and placenta decreases the intrauterine tension and decreases the radii of curvature of the muscle fibers. This may remove enough of the stimulus to cause a partial loss of the contractibility and retractibility. We believe that a properly applied pack, by increasing uterine tension and the radii of curvature of the muscle fibers, increases the ability of the uterus to contract and retract, thereby controlling bleeding.

Usually, when a pack is unsuccessful, it is because it has not been properly applied. Since the gradient of contractile force is from the fundus towards the cervix, it is at the fundus that the intrauterine tension and radii of curvature must be first increased. This can be easily accomplished by one man, using a cannister-type packer* (Fig. 1) devised by one of us (E.G.W.), with a roll of sterile 4-inch gauze. The tip of the packer is inserted through the cervix to the fundus. It should be palpated through the abdomen to note that it is in correct position before packing is begun. By successive, rapid strokes of the toothed plunger, 5 to 10 yards of gauze packing can be inserted within a few seconds. Additional sterile gauze packs may be placed in the packer and tied to the preceding roll, if more packing is necessary. Increasing the gauze in the fundus backs the packer out of the uterus as it becomes full. It should be noted that no retractors are necessary and that the gauze does not touch any part of the patient before being deposited in the uterine cavity. The pack need not remain in long. Some of ours have been removed after as short a time as thirty minutes. Others have remained in twenty-four hours. Actually, as soon as the uterus begins to contract normally on the pack, it can be slowly withdrawn, removing a few feet at a time so that the uterus is not suddenly, emptied.

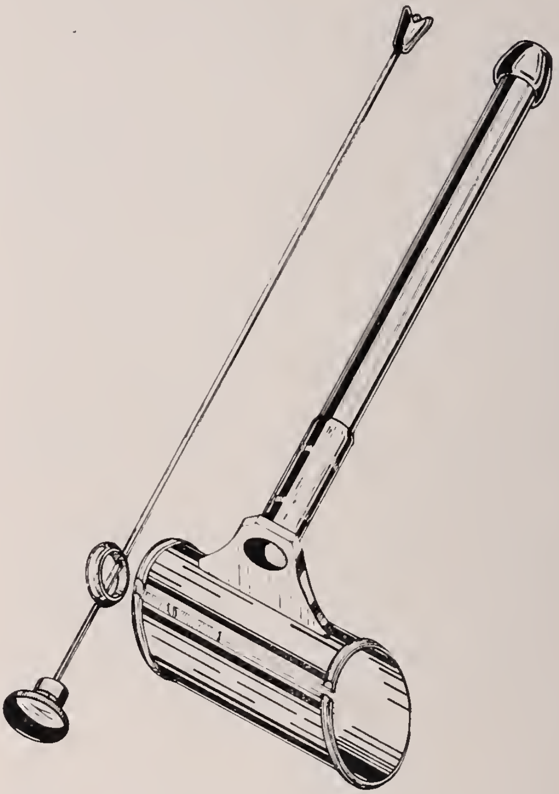


Fig. 1. The cannister type (Gomco) uterine packer used in this study. A 4 inch gauze may be inserted into the cannister and the free end brought up through the slot and into the barrel. It may be sterilized already loaded. Additional sterile 4 inch gauze rolls may be inserted as needed while the packer is in use.

(Continued on Page 125)

---

*This packer is manufactured by the Gomco Surgical Equipment Corp., 828 East Ferry Street, Buffalo, N. Y.

Now Available

7 Years Sickness Benefits

(HOUSE CONFINEMENT NOT REQUIRED)

Lifetime Accident Benefits

This extension of benefits is now available to you as a member of the Minnesota State Medical Association. Since December, *1947,* the inception date of our plan for members of your Association, the Caswell-Ross Agency has attempted at all times to secure for you the finest coverage in the accident and sickness field. These improvements will make your policy the best among many available to you. An application has been sent to you previously—why not complete and return it to our office now.

CASWELL-ROSS AGENCY

1177 N. W. Bank Building Minneapolis 2, Minnesota
Minneapolis—FE 2-2585 St. Paul—MI. 5-7004

Administrators of Professional Disability Plans

Minnesota State Bar Association
Minnesota State Dental Association
Minnesota State Medical Association
Minnesota Society of C. P. A.
Minnesota State Pharmaceutical Assn.
Minnesota Auto Dealers Association
Minnesota Federation of Eng. Societies
Minnesota State Veterinary Medical Soc.
Hennepin County Medical Society
Hennepin County Bar Association
11th Judicial Bar Association
Minneapolis Association of Life Underwriters
Minnesota State Life Underwriters Assn., Inc.
Ramsey County Medical Society
Ramsey County Bar Association
St. Paul District Dental Soc.
Minneapolis District Dental Soc.
St. Cloud Dental and Stearns County Medical Society
Duluth District Dental Society
East Central Medical Society
St. Louis County Medical Society
West Central Dist. Dental Society
Northwest Proprietors Association
St. Paul Life Underwriters, Inc.

PHOTO DATA. CAMERA: 4X5 REFLEX; EXPOSURE: 1/200 SEC. AT F.8 EXISTING LIGHTING.

ACHROMYCIN*

Hydrochloride

Tetracycline HCl *Lederle*

dely prescribed because of these important advantages:

1 rapid diffusion and penetration
2 prompt control of infection
3 negligible side effects
4 true broad-spectrum activity (proved effective against a wide variety of infections caused by Gram-positive and Gram-negative bacteria, rickettsiae, and certain viruses and protozoa)
5 every gram produced in Lederle's *own* laboratories under rigid quality control, and offered *only* under the Lederle label
6 a *complete* line of dosage forms

DERLE LABORATORIES DIVISION AMERICAN *Cyanamid* COMPANY PEARL RIVER, NEW YORK **Lederle**

U. S. PAT. OFF.

CLINICAL REVIEWS

Mayo Clinic and Mayo Foundation

April 9, 10 and 11, 1956

Rochester, Minnesota

This 3-day program will be devoted to lectures and discussions on problems of current interest in general medicine and surgery. The presentations will be made by staff members of the Mayo Clinic and the Mayo Foundation for Medical Education and Research.

The number of physicians who can be accommodated is necessarily limited. Those wishing to attend should communicate with Mr. R. C. Roesler, Mayo Clinic, Rochester, Minnesota.

There are no fees of any kind.

Affiliated with St. Croix Memorial Hospital
MEDICAL STAFF
Fred B. Reigel, M.D., *Chief of Staff*
J. C. Belshe, M.D., *Asst. Chief of Staff*
Norwood E. Wegner, M.D.

HELP FOR PROBLEM DRINKERS *

* The Problem Drinker is one whose drinking causes a continuing and growing problem in any department of his life.

IF YOU HAVE PATIENTS IN THIS CATEGORY . . . . INVESTIGATE!

Hazelden is a non-profit organization, designed to help problem drinkers return to normal living. Its peaceful country setting is on beautiful Lake Chisago, near Center City, 45 miles northeast of the Twin Cities, with spacious grounds, suitable and well-equipped buildings. Hazelden is secluded, yet within easy reach of U. S. Highway 8.

Your Inspection Is Invited.
Complete Information on Request.

Director
LYNN CARROLL

Hazelden

Twin Cities Office
341 North Dale Street - Saint Paul, Minn.

24 Hour Telephone—CApital 7-6397

Oxygen Therapy in the Premature Infant as a Cause of Retrolental Fibroplasia

ROBERT W. HOLLENHORST, M.D.
Rochester, Minnesota

LITTLE doubt remains that the injudicious administration of oxygen to premature infants is a major factor in the development of the retinopathy of prematurity, or retrolental fibroplasia.

This tragic disease, in which the retinal vessels and their supporting connective tissue proliferate onto the surface of the retina and into the vitreous, is the major cause of blindness in the United States today. Of all infants affected by retrolental fibroplasia, 98 per cent are premature, predominantly those whose birth weight is less than 1,500 gm. About 2 per cent of cases are found in full-term infants.

The first signs of the disease usually appear during the first month of life. The retinal vessels enlarge and become tortuous. Hemorrhage or transudation may appear and neovascularization may be present. The active stage may develop slowly or with extreme rapidity. Activity usually subsides during the third or fourth month and the cicatricial phase begins about the sixth month.

Course of Retrolental Fibroplasia

At the 1954 meeting of the American Academy of Ophthalmology and Otolaryngology, a panel on the subject of retrolental fibroplasia[1] recommended division of the course of the disease into three periods, namely active, regressive and cicatricial.

Active Period. — The panel subdivided the period of activity into the following five stages: (1) the vascular stage, in which the retinal vessels become dilated and tortuous and in which regions of neovascularization may appear in the periphery; (2) the retinal stage, in which the vitreous becomes hazy, neovascularization becomes more advanced and hemorrhage and gray edematous zones may appear in the peripheral parts of the retina; (3) the stage of early proliferation, in which newly formed vessels invade the vitreous; (4) the stage of moderate proliferation which is arbitrarily reached when such proliferation involves half the retina and (5) the stage of advanced proliferation, which is reached when the entire retina becomes detached or massive intraocular hemorrhage is present.

Regressive Period. — Regression occurs commonly. In about a third of the infants who have retrolental fibroplasia, the disease does not progress beyond the aforementioned Stage 1; the disease stops at Stage 2 in a fourth of the patients, while the disease in the remainder goes on to Stages 3, 4 or 5. When the disease is mild, the patients recover with little permanent damage. The disease occasionally may regress for a period and then briefly become active again if an infection develops.

Cicatricial Period. — The cicatricial phase follows the period of regression. The amount of permanent damage varies from none to a completely disorganized mass of detached retina, hemorrhage and proliferated vessels. The panel also divided this period into five stages as follows: (1) minor changes, consisting of a slight change in vascular caliber, small zones of retinal pigmentation or small masses of opaque tissue in the periphery of the fundus; myopia is common in these patients; (2) distortion of the optic disk, which may be caused by contraction of scar tissue in the peripheral zones; the disk and blood vessels are drawn toward a peripheral mass; (3) a retinal fold, which may extend to a mass of opaque tissue, usually in the temporal periphery, and as a rule contains the retinal vessels; several such folds may be present; (4) an incomplete retrolental mass, which may cover part of the pupillary region, and (5) a complete retrolental mass, which

---

Part of a round-table discussion at the meeting of the Minnesota State Medical Association, Minneapolis, Minnesota, May 23 to 25, 1955.

From the Section of Ophthalmology, Mayo Clinic and Mayo Foundation, Rochester, Minnesota. The Mayo Foundation is a part of the Graduate School of the University of Minnesota.

is composed of detached retina and fibrous tissue and which may completely fill the retrolental space; elongated ciliary processes are visible at the equator of the lens; the anterior chamber may be extremely shallow but later it may become extremely deep; anterior and posterior synechiae are common; secondary glaucoma and an opaque cornea occur; because growth of the eye is inhibited, the eye remains small and the upper lids appear sunken.

The disease in about a fourth of the afflicted infants develops to Stages 4 and 5 of this cicatricial phase; in a third of the patients, it develops to Stages 1, 2 or 3, whereas the disease in the remainder heals with no visible residuals.

Pathogenesis of Retrolental Fibroplasia

Vascularization of the retinas of animals and human beings occurs relatively late in embryonal life. Vascularization in man is essentially complete at full term, whereas in mice, rats, kittens and puppies, this process continues for a variable time after birth. As a consequence, the premature infant is born with an incomplete retinal vasculature. Retinal vascular proliferation normally is most active during the sixth and seventh months of embryonal life; retrolental fibroplasia is most likely to develop in babies born at this period.

Retinal vascular proliferation progresses normally in the unborn child under conditions of low oxygen tension. If this condition persists into extra-uterine life and oxygen deficiency is absent at this time, no difficulties ensue. However, if a high oxygen tension is produced by exposure of the infant to high concentrations of oxygen, the retinal vessels constrict greatly. If this tension is maintained for three or four days, an irreversible vasoconstriction may obliterate these vessels as the result of either adhesions of the vascular endothelium or intravascular clotting, according to Ashton and associates.[2,3] Thus, hypoxia ensues and vascular proliferation begins. Instead of a smooth growth, the capillaries now sprout to form whorls of varicose capillaries like renal glomeruli. The supporting mesenchymal connective tissue also proliferates. Hemorrhage and transudation may appear, and the capillaries burst out of the retina to form sheets on the surface of the retina and in the vitreous. Retinal detachment is caused by both transudation of fluid and fibrotic strands in the vitreous.

TABLE I. INCIDENCE OF RETROLENTAL FIBROPLASIA IN PREMATURE INFANTS WEIGHING LESS THAN 1,500 GM.

Year	Infants	Retrolental Fibroplasia, Cases
1948	4	0
1949	4	0
1950	3	0
1951	14	3
1952	4	1*
1953	6	1
1954	5	1
Total	40	6

*Also one case in a 1,720-gm. infant.

Relationship to Oxygen Therapy

Typical lesions of retrolental fibroplasia have been produced by exposing newborn puppies, rats, mice and kittens to high oxygen tensions.

Szewczyk[4] presented evidence that the disease appears as a result of hypoxia induced either at or before birth, followed by further injury by means of relative hypoxia when the infant is removed too rapidly from an atmosphere containing high concentrations of oxygen.

The personnel of eighteen hospitals collaborated in a study of large groups of premature infants whose birth weights were less than 1,500 gm. This study was reported by Kinsey and Hemphill.[5] These infants at birth were assigned to one of two groups, namely (1) a "routine oxygen group" who received oxygen for twenty-eight days at a concentration of 50 per cent or more and (2) a "curtailed oxygen group" who received oxygen only on the basis of frank chemical need. The mortality rates were the same in each group. However, retrolental fibroplasia developed in 73 per cent of the first group and only 30 per cent of the second group; 25 per cent of the first group but only 6 per cent of the second group had permanent ocular damage. The initial ten days of exposure to oxygen appeared to be the most damaging. Those patients exposed to a concentration of oxygen of less than 40 per cent had a lower incidence of the disease.

During the period 1948 through 1954 at St. Marys Hospital in Rochester, Minnesota, there were 10,826 live births, of which 689 represented prematures weighing 2,500 gm. or less. Of this group, forty surviving infants weighed less than 1,500 gm. Retrolental fibroplasia developed in six (15 per cent) of this group and in one infant who weighed 1,720 gm. These babies were distributed as indicated in the table. All patients at this hospital are under the care of Mayo Clinic physicians.

Just why cases of this disease were not encountered at the Mayo Clinic prior to 1951 is not known. Routine ophthalmoscopic examinations were not done until 1950, and consequently, undiscovered cases of subclinical disease may have occurred that regressed to Stage 1 or Stage 2 of the period of cicatrization. All three patients seen in 1951 became completely blind; they included a set of twins, as well as a child kept in oxygen for five weeks because of multiple abscesses and severe toxicity. One child with retrolental fibroplasia in 1952 was born with agenesis of the right cerebral hemisphere; the ocular disease advanced only to Stage 2 of the active period and then regressed. The other child became completely blind. The lesion in the child born in 1953 developed to Stage 5; he was born nine days before the mother died of advanced congenital cardiac disease and massive cerebral hemorrhage. The child born in 1954 sustained massive intra-ocular hemorrhage into one eye one week after birth and now has a large mass of scar tissue in the temporal portion of the fundus; the other eye has remained normal. As dilated blood vessels were not seen in either eye, the hemorrhage may not have been a manifestation of the disease but may have been due to some unknown cause.

Half of the six patients were seen in the three-year period since our "austerity" program for oxygen therapy in prematures was begun in 1952. These three infants were given a minimum of oxygen.

Management

In the management of the premature infant, it is the practice of our pediatricians to use as low a concentration of oxygen as possible during as brief a time as feasible. This is usually during the first twenty-four to forty-eight hours only. Adequate respiration usually is established during that time, and the administration of oxygen is terminated. Occasionally, use of oxygen must be resumed for short periods. The concentration is kept at a level less than 40 per cent and frequent checks on the concentration are made.

The eyes of all prematures probably should be examined by an ophthalmologist, especially if the birth weight is less than 1,500 gm. The initial examination should be made during the first week. We prefer to use 1 drop each of a 2 per cent solution of homatropine and a 10 per cent solution of phenylephrine (neosynephrine) hydrochloride for dilating the pupil. Atropine is not used in these small infants. A small lid speculum is helpful. Re-examination is done every week during the first month and every two weeks during the second and third months. If the eyes have shown no abnormalities by the end of the third month, examinations are discontinued.

If retrolental fibroplasia develops, the pupils should be kept dilated with homatropine to prevent posterior synechiae. At the present time, no therapy appears to be of avail. Transfusions have an adverse effect if the disease is present.[4] If glaucoma develops, as it does in about a fourth of the cases of severe disease, miotics such as pilocarpine or physostigmine are often effective in reducing the intra-ocular tension.

It is important to acquaint the parents of a blind child with the educational and social facilities available to such a child.

Conclusions

Retrolental fibroplasia is a disorderly proliferation of blood vessels and connective tissue induced in the undeveloped retina of the premature infant, at least in part, by injudicious use of high concentrations of oxygen.

The lowest possible concentration of oxygen administered to the premature over the shortest possible time should be the rule in management.

Great variations in the concentration of oxygen should be avoided.

References

1. Reese, A. B., Owens, W. C., Friedenwald, J. S., Silverman, W. A., Kinsey, V. E., Hemphill, F. M., Patz, Arnall, and Blodi, F. C.: Symposium: retrolental fibroplasia (retinopathy of prematurity). Tr. Am. Acad. Ophth., 59:7-41 (Jan.-Feb.) 1955.
2. Ashton, Norman, Ward, Basil, and Serpell, Geoffrey: Rôle of oxygen in the genesis of retrolental fibroplasia: a preliminary report. Brit. J. Ophth., 37:513-520 (Sept.) 1953.
3. Ashton, Norman, Ward, Basil, and Serpell, Geoffrey: Effect of oxygen on developing retinal vessels with particular reference to the problem of retrolental fibroplasia. Brit. J. Ophth., 38:397-432 (July) 1954.
4. Szewczyk, T. S.: Retrolental fibroplasia. Pediat. Clin. North America, 1:607-623 (Aug.) 1954.
5. Kinsey, V. E., and Hemphill, F. M.: Etiology of retrolental fibroplasia and preliminary report of cooperative study of retrolental fibroplasia. [Part of symposium as listed in Ref. 1.] Tr. Am. Acad. Ophth., 59:15-24 (Jan.-Feb.) 1955.

Massive Upper Gastrointestinal Bleeding

Results of Surgery during Acute Phase

W. P. EDER, M.D.
Minneapolis, Minnesota

THE treatment of the patient with massive upper gastrointestinal hemorrhage has been a controversial problem for many years. There are many who believe that blood replacement and the use of a good dietary regime is the treatment of choice. This group advises operation when:

1. The patient, after being admitted in shock and given 1,000 to 1,500 cc. of blood, exhibits signs of vascular collapse.
2. The patient cannot maintain a constant blood pressure and hematocrit in spite of 500 cc. of blood every eight hours.
3. Massive hemorrhage recurs during treatment.
4. The patient is over the age of fifty and has bled to shock levels at any time, medical treatment should be used with caution.

Under such management only those patients who demonstrate persistent bleeding or recurrent bleeding are referred for surgical management of their gastrointestinal hemorrhage. With such management the mortality rate is reported in several series to be 17 to 35 per cent. Such management places the surgeon in the position of having to salvage a rather desperate situation. In spite of this adverse situation, many patients have been salvaged by surgery and at the same time have had definitive treatment for their ulcer diathesis.

Recently the surgical approach to this problem has been emphasized by several authors who point out that continued hemorrhage and repeated hemorrhage from peptic ulcer is a grave and serious problem. They also point out that surgical management of this entity can be carried out with an over-all mortality rate which is less than that for other types of management.

Statement of the Problem

It was the impression of the surgical staff at the Minneapolis General Hospital that the number of patients seen at that institution with massive upper gastrointestinal hemorrhage from peptic disease was greater than usually seen at an average hospital. Ample opportunity presented itself to study this group of patients. Through the co-operation of the medical service all patients with gastrointestinal hemorrhage were admitted directly to the surgical service. During a five year period each such patient was evaluated by the surgical house staff and the attending surgical staff relative to the source of the patient's gastrointestinal hemorrhage, the amount of bleeding which had occurred and the feasibility of surgical treatment of his gastrointestinal hemorrhage. All patients were seen in consultation by members of the medical service and the patient's cardiovascular status and general physical status were completely evaluated. Surgical management of every patient with massive upper gastrointestinal hemorrhage was carried out.

Material and Methods

The material presented is taken from the surgical service at the Minneapolis General Hospital for the period January 1, 1950, to January 1, 1955, and represents 100 consecutive cases of massive upper gastrointestinal hemorrhage. The patients are divided into Series A and Series B.

Series A constitutes fifty patients who were seen from January 1, 1950, to July 1, 1951. The following criteria were used in the management and treatment of this group of patients:

1. The patient must have demonstrated gastrointestinal hemorrhage within seven days prior to admission.
2. The existence of "massive" upper gastrointestinal hemorrhage was defined by the presence of:
   - (a) A hemoglobin of less than 10 grams per cent or;
   - (b) A hematocrit of less than 25 volumes per cent or;
   - (c) Signs of shock as manifest by a positive tilt test, a systolic blood pressure of less than 100 mm.

Inaugural Thesis presented before the Minneapolis Surgical Society, April 7, 1955.

Hg, persistent tachycardia, peripheral vascular collapse, or;

(d) Objective evidence of massive blood loss while hospitalized.

These patients were considered to have massive gastrointestinal hemorrhage and the following principles were applied in the treatment of these patients:

1. Immediate whole blood transfusions were started and blood replacement was continued until the hemoglobin reached 14 grams per cent and the hematocrit 40 volumes per cent.
2. Concomitant medical disease must be under adequate control.
3. No bleeding diathesis should be present as ruled out by the bleeding and clotting time, prothrombin time, fractional proteins, cuff test and platelet count.

Surgical intervention was undertaken when these principles were met. The choice of procedure was left to the discretion of the operating surgeon. Deviation from these principles was permitted only when:

1. Continued bleeding as demonstrated by persistent melena or persistent hematemesis or persistent shock indicated immediate surgery in spite of an inadequate blood replacement.
2. The resumption of bleeding after all obvious bleeding had stopped indicating recurrent peptic ulceration and hemorrhage.
3. Uncontrolled medical disease.

Series B constitutes fifty patients seen between July 1, 1951, and January 1, 1955. This series differs from Series A only in that the estimation of blood loss was not done by hemoglobin, hematocrit levels or on the basis of impending shock or a positive tilt test but on the determination of plasma volume and red cell mass by the use of T-1824 vital dye. By this method adequate blood replacement could be done in relationship to quantity and to the time necessary to replace the blood loss. The definition of massive gastrointestinal hemorrhage in Series B is based upon a total circulating red cell mass deficit of more than 50 per cent. Therefore, in Series B the term "massive" gastrointestinal hemorrhage is clearly defined. When the quantity of whole blood indicated by the red cell mass deficit had been replaced, the plasma volume and red cell mass were again determined. If there had been progressive hemorrhage during the period of blood replacement, this fact was reflected at the time of the second blood volume determination and further blood was given. When a calculated normal red cell mass had been obtained, the patient was operated upon.

All of the surgical procedures were done by the surgical house staff and the attending staff of the surgical service. The results do not reflect the surgical ability of one or two surgeons but rather a group of well qualified house surgeons under the supervision of their attending staff.

No patient with esophageal varices is included in group B because other surgical principles were being applied to all patients with portal hypertension.

The surgical procedure carried out in both Series A and Series B was a subtotal gastric resection which varied in its extent from 65 per cent to 80 per cent resection. There were no vagotomies in either series.

Series A.—The average age of this group was fifty-six years. The distribution within the age group is to be found in Table I. There were no patients under the age of twenty and only one patient over the age of seventy-nine. The greatest incidence was between the age of fifty and seventy.

TABLE I. AGE DISTRIBUTION

Series A	
0-19	0
20-29	1
30-39	5
40-49	6
50-59	10
60-69	19
70-79	8
80-	1

The quantity of blood given to the patients preoperatively varied from 2,000 to 8,500 cc. The average preoperative quantity of blood was 3,500 cc.

The duration of symptoms presented by the patient varied from two hours to seven days. The average duration of symptoms prior to admission was 2.6 days. Eighteen patients (36 per cent) demonstrated melena only, fifteen patients (30 per cent) hematemesis only and seventeen patients (34 per cent) both melena and hematemesis.

The incidence of previous ulcer history was 56 per cent. No patient is included on the basis of ulcer history alone. Twelve patients gave a history of previous upper gastrointestinal bleeding;

four patients gave a history of previous perforation and twelve patients gave a history of roentgenological demonstration of peptic ulcer.

The source of the bleeding in this group of fifty patients is tabulated in Table II. The greatest incidence was due to duodenal ulcer with the second greatest incidence due to gastric ulcer. In this series there is one patient with esophageal varices and six with severe alcoholic gastritis. In one patient the source of the bleeding could not be found and an empirical gastric resection was done.

TABLE II. SOURCE OF BLEEDING

Series A

Duodenal Ulcer	30
Gastric Ulcer	12
Gastritis	6
Varices	1
Unknown	1

TABLE III. TIME—ADMISSION TO SURGERY

Series A

Less than 24 hours	16
Less than 48 hours	9
Less than 72 hours	8
Less than 96 hours	9
More than 96 hours	8

The time from admission to surgery is tabulated in Table III. One-half of the patients were operated upon within the first forty-eight hours; eight patients were operated upon between five and eighteen days after admission. This delay in their surgery was due to medical complications. Three patients had delirium tremens due to their acute alcoholism. Three patients had cardiac damage sufficient to delay their surgery until adequate management could be undertaken. One patient suffered a drug reaction and one patient developed pneumonia.

There were seven deaths in this series for an over-all mortality rate of fourteen per cent. The average number of hospital days was 18.1.

Series B.—The average age in this group was 55.2 years. The age distribution is tabulated in Table IV. The greatest incidence, again, as in Series A, is between the ages of fifty and seventy-nine. There was one patient under the age of twenty and one patient over the age of seventy-nine.

The quantity of blood given this group of patients ranged from 2,500 to 7,000 cc. The average was 4,000 cc. or 500 cc. more than in Series A.

The symptoms of the patients varied from two hours to four days prior to admission. The average was two days. Twenty patients (40 per cent) demonstrated melena only, fifteen (30 per cent) hematemesis only and fifteen (30 per cent) both melena and hematemesis.

TABLE IV. AGE DISTRIBUTION

Series B

0-19	1
20-29	1
30-39	4
40-49	7
50-59	17
60-69	10
70-79	9
80-	1

In this group the incidence of previous peptic ulcer history was 38 per cent. Only seven patients (14 per cent) had previously bled. There were two patients (4 per cent) with previous perforation. In ten patients (20 per cent) roentgenological demonstration of peptic ulcers had been made.

TABLE V. SOURCE OF BLEEDING

Series B

Duodenal ulcer	26
Gastric ulcer	14
Gastritis	5
Unknown	5

The source of the hemorrhage in this group is tabulated in Table V. Duodenal ulcers accounted for bleeding in twenty-six patients (52 per cent) and gastric ulcers in fourteen patients (28 per cent). In five patients no source of bleeding could be found and empirical gastric resection was carried out.

The time from admission to surgery varies in several important respects from Series A (Table VI).

TABLE VI. TIME—ADMISSION TO SURGERY

Series B

Less than 24 hours	0
Less than 48 hours	16
Less than 72 hours	19
Less than 96 hours	8
More than 96 hours	7

There were no patients operated upon in less than twenty-four hours. Sixteen patients were operated on within thirty-six hours and thirty-five patients were operated on within seventy-two hours. Seven patients were operated on between five and sixteen days. This delay was due to indecision on the part of two patients to accept surgical therapy, to infectious processes which required treatment in three instances, to a thromblophlebitis developing at the site of a transfusion in one instance and to alcoholic delirium tremens in one instance.

The average hospital days in this group was 17.7 days. There were three deaths in this group for an over-all mortality rate of 6 per cent.

TABLE VII. AGE DISTRIBUTION IN 100 CASES

0-19	1
20-29	2
30-39	9
40-49	13
50-59	27
60-69	29
70-79	17
80-	2

TABLE VIII. SOURCE OF ACTIVE BLEEDING IN 100 CASES

Duodenal ulcer	56
Gastric Ulcer	26
Gastritis	11
Varices	1
Unknown	6

Combining Series A and Series B into a total of 100 consecutive patients, the data are tabulated in Tables VII, VIII, IX and X.

The over-all mortality rate for this series is 10 per cent.

Discussion

Series A represents a group of patients in which the criteria for "massive" gastrointestinal hemorrhage is somewhat vague. However, the criteria applied to this group are those criteria which have been used in assessing the presence of massive upper gastrointestinal hemorrhage prior to the use of plasma volume determination. This series, therefore, represents a group of patients who can be compared with previous series reported in the literature. That hemoglobin and hematocrit values are not adequate criteria upon which to judge a patient's operability is obvious. Undoubtedly some of the patients in this group were operated upon when their total plasma volume and red cell mass were far from normal. Also, the rate at which the transfusions were given did not coincide with the rate of blood loss and, therefore, did not permit good preoperative preparation.

The seven deaths in this series are worthy of discussion. Patient 4961 died on the fourth postoperative day of a subphrenic abscess. No source for this abscess could be found in either the suture line of the duodenal stump or the gastroenterostomy; however, it is assumed that such leakage did occur and that the over-whelming toxicity of infection precipitated his demise. Patient 2070 died on the third postoperative day following wound dehiscence and evisceration and pneumonia. Patient 2596 died on the fifteenth postoperative day of a subphrenic abscess. Patient 2650 died on the sixth postoperative day of bronchopneumonia. Patient 1067 died on the second postoperative day of an internal hernia of the small bowel. Patient 2725 died on the second postoperative day of a cerebral vascular accident. Patient 2831 died on the third postoperative day of massive atelectasis and thyrotoxicosis. These seven deaths represent probable technical errors in three patients and inadequate preoperative preparation of one patient. The three patients who expired due to evisceration and pneumonia and due to atelectasis and the cerebral vascular accident probably cannot be attributed to technical errors.

TABLE IX. TIME FROM ADMISSION TO SURGERY IN 100 CASES

Less than 24 hours	16
Less than 48 hours	25
Less than 72 hours	27
Less than 96 hours	17
More than 96 hours	15

TABLE X. MORTALITY RATE IN 100 CASES

Series A	14%
Series B	6%
Series A and B	10%

It became evident after reviewing the first fifty patients that improved preoperative management of this critically ill group of patients might well reduce the mortality rate. We were also impressed with the fact that the quantity and rate of transfusions were not adequately measured. By utilizing T-1824 vital dye we were better able to determine the quantity of blood needed by our patients and the rate at which this whole blood was to be administered. By repeating the plasma volume and red cell mass just prior to surgery we were able to determine whether bleeding had continued while blood replacement had been carried out and to quickly replace this additional loss of blood just prior to surgery. In addition none of the patients were operated on within the first twenty-four hours in order to provide our medical colleagues with a better opportunity for full clinical evaluation. We had hoped by this to avoid early surgical intervention in patients with advanced cardiac disease and other controllable disease processes so that we might place these patients in a better state of operability.

In Series B there were three deaths. The first death, Case 6133, was the first patient in this series. He successfully underwent his preoperative blood replacement and subtotal gastric resection. He was well on his way to recovery when he rebled massively on the eighth postoperative day. He received twenty-seven units of blood in a period of approximately four hours. At reexploration the duodenal ulcer was found to be actively bleeding. The bleeding was controlled. However, the patient developed a wound dehiscence, wound infection and finally succumbed on his forty-first hospital day of acute yellow atrophy of the liver. Patient 77033 expired on the twelfth postoperative day of progressive hypotension which was not attributable to continued bleeding. No autopsy was obtained and it was assumed that his death was on a cardiac basis. Patient 77753 died on the fifth postoperative day of bronchopneumonia. It is interesting to note that all but the first death in this series were in patients who continued to bleed during their immediate hospital stay and were operated upon before optimal blood replacement had been given in order to attempt to control their acute hemorrhage. It was, nevertheless, gratifying in Series B to have reduced the mortality rate from 14 to 6 per cent. It is still more gratifying to know that this study extends beyond the confines of this report and that the over-all mortality rate is now less than 6 per cent.

With the availability of plasma volume determinations in all hospitals equipped with well run laboratories, the clinician has at his disposal a means of more accurately replacing the blood loss in a patient with massive upper gastrointestinal hemorrhage. In the hands of an experienced gastric surgeon, surgical principles may be applied to this clinical entity with an over-all mortality rate which approaches the mortality rate of elective gastric resection for peptic disease. With the experience gained in this group of 100 patients, the mortality rate has been reduced progressively from 14 to 6 per cent. Since the criteria of massive gastrointestinal bleeding applied to Series B is the most critical criteria applied to any series yet published, we feel that the over-all mortality rate is even more significant.

Conclusions

Gross bleeding into the upper gastrointestinal tract is a serious complication of peptic ulcer. The prolonged hypoxia from acute hemorrhage produces complications which increase the mortality and morbidity rate. The diagnosis of gross bleeding can be made with considerable ease and its quantity with reasonable accuracy. The surgical arrest of such bleeding and the treatment of the ulcer diathesis can be carried out with a relatively low mortality rate.

WHO REPORTS ON SALK VACCINE SURVEY

According to the report of the World Health Organization's study group on poliomyelitis vaccination, the United States is the only country which showed ill effects from polio vaccinations, with some of its cases traceable to faulty vaccine batches. In all, approximately 10 million children were vaccinated against polio with no subsequent effect. In addition, the study group noted that although no definite immunity period has been established in connection with Salk vaccine, it has given good protection to children between the ages of six and ten.

Norway, Sweden, South Africa, Canada, Denmark, France, Germany, the United Kingdom and the United States participated in the WHO study group meeting in Stockholm. The 40-page summary report they issued contains recommendations regarding the use of polio vaccine and is intended as a guide to world health authorities "who may be considering whether or not to begin polio vaccine programs." Topics of the report include the application of stringent safety tests; the seriousness of an existing polio situation in a country and the cost of a vaccine program in relation to available funds, timing of a vaccine program and utilization of virus strains.

Hookworm Treatment of Polycythemia Vera

JAMES MYHRE, M.D., and
FRANKLIN WALLACE, Ph.D.
Minneapolis, Minnesota

FOREIGN authors[1,2,3] have utilized hookworm for therapy of polycythemia vera. The low-grade symptomless blood loss due to this intestinal parasite theoretically sounds reasonable for relieving these patients of their plethora. This form of treatment has been given to one patient with a satisfactory result in a fourteen-month follow-up. To the best of our knowledge, this is the first use of this treatment in the United States.

Case Report

The patient was a fifty-one-year old white woman, a school teacher in whom a diagnosis of polycythemia vera was made in 1937. At that time she had an enlarged liver and spleen. For the following fourteen years she was treated with phenylhydrazine and venesections. She was first seen by the senior author in March, 1951, when she was quite weak but actively teaching school, with a hemoglobin of 9.9 grams per cent (Evelyn) and a hematocrit of 35. There were 11,100 leukocytes, with 84 per cent neutrophiles, 2 per cent eosinophiles, 13 per cent lymphocytes and 1 per cent monocytes, and 3.55 million erythrocytes. Bone marrow studies revealed a normoblastic hyperplasia without any evidence of leukemia. Phenylhydrazine was discontinued and in five weeks the hemoglobin was 17.7 grams per cent. The highest hematocrit recorded was 65.

Venesection therapy was begun again. In the eight months remaining in 1951 she had removed by venesection 1,900 cubic centimeters of blood; in 1952, 3,200 cubic centimeters of blood; and, in 1953, 2,000 cubic centimeters of blood. The time of venesections was largely determined by symptoms of the patient and, in general, venesections were done when the hematocrit was over 55. The lowest hematocrit was 45, and at this time the patient was quite weak and quite short of breath, especially after climbing stairs. She would plan to have her venesections on a Friday so that she could recover in bed to be back at school teaching on Monday. Before the venesections she was generally extremely uncomfortable and complained of headaches, fullness in the head, unsteadiness, clumsiness, feeling flushed and weak with scattered paresthesias over her body.

On January 29, 1954, she gave 500 cubic centimeters of blood by venesection. On February 4, 1954, there were 14 grams per cent of hemoglobin (Evelyn) with 8.04 million erythrocytes; a hematocrit of 53; 16,500 leukocytes with 81 per cent neutrophiles, 13 per cent lymphocytes, 1 per cent monocytes, 4 per cent eosinophiles, 1 per cent basophiles; reticulocytes 0.9 per cent; platelets 401,000; MCV 66; MCH 17; and MCC 26 per cent. Two hundred and sixty *Ancylostoma duodenale* larvae were administered percutaneously.

The source of the hookworm larvae was a native of Iraq, and the parasites were identified as *Ancylostoma duodenale* by the unequal esophageal spears and the close approximation of the anterior end of the intestine and the esophagus in the infective larvae.

A stool specimen was mixed with powdered charcoal and incubated at room temperature for two weeks. The mixture was then placed in a Baermann funnel and the infective larvae were collected. The larvae were filtered out of the suspending water and the filter paper, with the larvae down, was again placed on five layers of gauze on the screen of a Baermann funnel and the larvae were collected a second time in clean water. The glassware used was heat sterilized but no further precautions against possible bacterial contamination were taken.

The larvae were suspended in 15 cc. of water, and from counts of 1/10 cc. samples an estimate of 260 larvae was made. The suspension was poured on a 3-inch disc of white blotting paper which was laid upon the patient's left thigh for one hour. The patient noticed a very mild local itching during the exposure and that evening more of the itching occurred. For the next ten days there was a swelling and thickening of the inoculation site with a hive-like formation that persisted for ten days.

Very shortly after this, the patient developed an upper respiratory infection as manifested by coryza and a sore throat. On February 22, 1954, she developed hoarseness and a "different" sore throat and frequently ran 0.2 degrees (F) of fever. This persisted for two weeks. On March 5, 1954, or one month after the administration of the larvae, she developed a severe night cough productive of a small amount of tannish sputum which persisted for one month. Then for nearly one month more she had a cough in the daytime productive of grey sputum. The patient was examined at weekly intervals and there were no abnormal findings in physical examination of the chest. On March 12, 1954, a chest x-ray showed findings interpreted as peribronchiolitis or perhaps a faint subsiding pneumonitis in the left lower lobe.

On March 26, 1954, or approximately six weeks after

Dr. Myhre is clinical assistant professor of medicine, Department of Internal Medicine, University of Minnesota Medical School.

Dr. Wallace is associate professor of zoology, University of Minnesota.

TABLE I.

Date	Hemoglobin Grams Per Cent	Hematocrit	Leucocytes Per c.c.	Eosinophiles Per Cent
4 Feb 54	14.0	53	16,500	4
12 Feb 54	14.8		22,800	3
22 Feb 54	15.1	53	21,800	2
5 Mar 54	15.2		23,500	10
12 Mar 54	14.3		25,200	15
19 Mar 54	14.8		18,600	15
26 Mar 54	15.0	54	17,300	20
2 Apr 54	15.4		23,000	28
15 Apr 54	15.0		21,200	31
4 May 54	14.4	55	19,450	30
27 May 54	15.3		17,750	21
7 July 54	14.6		28,700	44
9 Aug 54	15.0	54	33,400	36
17 Sep 54	14.9	54	26,600	26
5 Nov 54	14.8	54	21,400	35
29 Dec 54	15.0	55	27,000	22
9 Feb 55	14.6	51	26,000	22
15 Apr 55	15.3	55	27,500	25

the administration of the larvae, the patient noticed morning nausea with very occasional emesis. Her appetite decreased in general and especially for sweets. This lasted perhaps two weeks. In May, 1954, or approximately four months after the administration of the larvae, for one to two weeks she had two to three loose bowel movements per day. On June 1, 1954, with school in recess, she lost all symptoms, and began to feel very well, indeed better than she had felt in many years.

The ova first appeared in the stools eleven weeks after exposure and were then too few to quantitate. After eighteen weeks 1,100 ova were counted. Since then monthly counts have averaged 3,500, the highest figure being 5,200. The benzidine test has been intermittently negative to three plus and the Guaiac has generally been negative, although once it was three plus. We have estimated that she has fifty to seventy hookworms.

At the beginning of this therapy the hematocrit was 53, and fourteen months later it was 55 without venesections (Table I).

Résumé and Discussion

An intelligent female patient with polycythemia vera, who had given 7,100 cubic centimeters of blood by venesection over the previous three-year period, was given 260 larvae of *Ancylostoma duodenale*. She developed minor itching, distress and hives at the inoculation area on the thigh; a few days later coryza and sore throat unrelated apparently to the hookworm; eighteen days after inoculation a "different sore throat" with hoarseness and a very slight fever; one month later a very severe night cough with tannish sputum; and for the next month a daytime cough productive of grayish sputum. Six weeks after inoculation she had minor transient morning nausea with very occasional emesis and a loss of appetite for sweets. Three months after inoculation for one to two weeks she had two to three loose bowel movements per day. Since then the patient has felt very well and is pleased with her treatment. She is very gratified by not having the discomfort associated with the high hematocrit before venesection and the discomfort and weakness for two to three days after venesection. The hematocrit at the time of the beginning of treatment was 53 and one year later it was 51. During the fifth month after giving the parasites, the eosinophil count reached 44 per cent.

Brumpt[1] feels that the usual sequence of events is that three days after inoculation there is migration through the lungs with coughing which occasionally lasts up to three weeks. Then in eight days the parasites are in the duodenum and there is epigastric distress, greatest at about one month, followed by diarrhea of from four to ten loose stools per day up to two months. He feels that the diarrhea is the biggest disadvantage of this form of therapy though it can be controlled by opium preparations. In his experience, decrease in red blood cell counts began in one month and complete effect was present in three months.

The most obvious disadvantage of this treatment in the fourteen months of observation was the one month of severe night cough with a lesser day cough for approximately one more month. The patient had a severe upper respiratory infection which began promptly after exposure to the parasite, and it may well be that the patient had a combination of a separately incurred pneumonia of a minor degree with the migration of the parasites through the lungs. Certainly the upper respiratory infection began before one would expect the migration through the lungs and the coryza would not be a part of the infestation.

Epidemiologically the therapy is acceptable.

Advantages of this form of treatment appear to be that it is simple, inexpensive, and there does not appear to be need for detailed supervision or special laboratory facilities as for venesections or radio-active phosphorus therapy. There is a slow regular fall in the red blood cell count while on a completely ambulatory regime. The therapy lasts five to six years and treatment can be terminated at any time. The disadvantages are considered to be the diarrhea which can persist up to two months but can be controlled by paregoric, and, in this instance, a severe cough was the only apparent disadvantage after fourteen months' observation.

This form of therapy should be considered for hemachromatosis.[4]

(Continued on Page A-40)

Eosinophilia in Malignant Disease

DAVID G. HANLON, M.D.
Rochester, Minnesota

EOSINOPHILIA, occasionally of high degree, may be found in association with malignant disease, as exemplified in the following case.

Report of Case

The patient, a sixty-one-year-old farmer, was examined at the Mayo Clinic in November, 1954. The patient stated that he had been perfectly well until July, 1954. His previous medical history was irrelevant and his family history noncontributory. Early in July, 1954, influenzalike symptoms developed which consisted of generalized malaise, backache and a pleuritic type of pain in his chest. The patient had remained away from work for only three days, and on his return he was still plagued by migratory aches and pains, particularly low in the back. These symptoms persisted, and because the low back pain interfered with sleep, he consulted his doctor around August 1, 1954. Roentgenograms of the spinal column, stomach and colon were said to have been negative at that time. Two weeks later so-called indigestion, characterized by frequent eructations, flatulence and anorexia, developed for the first time. During his illness of four and one-half months' duration he lost approximately 10 to 15 pounds. Ten days prior to examination at the clinic a purpuric area appeared without trauma in the left forearm and this was followed by similar lesions on both legs.

Careful systemic review revealed that the patient had experienced a few night sweats and also two nosebleeds, the latter just prior to examination at the clinic. In addition on a few occasions he had noticed some blood in his stools. He was somewhat constipated and attributed this to a reduced intake of food.

Physical examination was not remarkable except for evidence of loss of weight and the purpuric lesions on both legs and one on the left forearm. In the center of each purpuric lesion there was a clear zone in which a thrombosed vein could be palpated. These lesions were interpreted as being due to segmental superficial thrombophlebitis. No abdominal masses were palpable and rectal examination gave negative results.

Laboratory studies were reported as follows: The urine was normal. The value for hemoglobin was 14.0 gm. per 100 cc. of blood; erythrocytes numbered 3,950,000 and leukocytes 13,400 per cubic millimeter of blood. The differential count of leukocytes showed lymphocytes, 9 per cent; monocytes, 4 per cent; neutrophils, 45 per cent; eosinophils, 37 per cent; basophils, 1 per cent; metamyelocytes, 3 per cent and myelocytes, 1 per cent. One normoblast was seen. The platelet count was 90,000 per cubic millimeter of blood. The sedimentation rate was 29 mm. in 1 hour by the Westergren method. The sulfobromophthalein test of liver function revealed 20 per cent retention (grade 2). The roentgenogram of the thorax depicted a small area of fibrosis in the base of the left lung but nothing otherwise significant. Roentgenograms of the stomach and colon were negative for lesions, and a roentgenogram of the lumbar vertebrae revealed a narrowed second lumbar interspace with localized hypertrophic change.

Examination of the peripheral blood smear revealed some hypochromasia, mild polychromasia, increased rouleaux formation and considerable eosinophilia. The platelets seemed slightly reduced in number. Many clumps of malignant cells which were foreign to bone marrow were found on examination of the bone marrow, establishing the fact that the patient had a metastatic malignant lesion.

The patient was advised of the findings and dismissed from our care on November 23, 1954. He died on January 8, 1955. His doctor wrote that at the time of the patient's last hospitalization, a rectal tumor was palpable for the first time. At postmortem examination done elsewhere, the rectum was involved with an annular neoplasm which had infiltrated the mesentery. No gross abnormalities of other organs were found.

Tissue was forwarded to the Mayo Clinic and reviewed by one of the pathologists, Dr. Baggenstoss, who commented that the sections taken from the rectum revealed a high-grade carcinoma infiltrating the entire wall and the perirectal fat. Carcinoma cells had replaced the mucosa in a few foci but there was actually more carcinoma in the wall than in the mucosa. Most of the cells were in sheets and clumps, but in an occasional area glandular formations suggested that the lesion was an adenocarcinoma, grade 4, probably arising in the rectum. There were large areas of necrosis of tumor cells.

Sections of pancreas revealed a moderate degree of acinar dilatation but they were otherwise not remarkable. Sections of liver and spleen presented evidence of active extramedullary hematopoiesis with mitotic figures in the hematopoietic foci.

Comment

This case has three especially interesting aspects: First, the association of superficial, segmental thrombophlebitis with primary carcinoma in the

---

Read at the meeting of the Southern Minnesota Medical Association, Albert Lea, Minnesota, September 12, 1955.

From the Section of Medicine, Mayo Clinic and Mayo Foundation. The Mayo Foundation, Rochester, Minnesota, is a part of the Graduate School of the University of Minnesota.

rectum is highly unusual. Such lesions are much more frequently associated with carcinoma of the pancreas, particularly carcinoma of the tail of the pancreas, and with other retroperitoneal malignancies. Their occurrence in carcinomas of the stomach and lung and in malignant lymphomas has been noted also.

The association of a high percentage of eosinophils with a malignant lesion of the gastrointestinal tract also is unusual. Such an association was rarely commented on in the American literature until 1946, when Isaacson and Rapoport[1] reviewed the literature dealing with this subject. They collected nineteen cases of pronounced eosinophilia with cancer in which more than 10 per cent of the leukocytes were eosinophils. In addition, these authors added fifteen new cases of malignant tumor in which marked eosinophilia occurred. In twenty-seven of their thirty-four cases (79.4 per cent) metastasis had occurred. In two of the other seven cases, metastasis was not proved but was suspected. In one case metastasis was neither proved nor suspected. In the other four cases the report did not give sufficient information to determine the presence of metastasis. In seventeen of the twenty-seven cases in which metastasis was proved, hepatic involvement was noted. In twenty-nine of the thirty-four cases the malignant lesions were of epithelial origin, and in five they were of connective-tissue origin. Cases of carcinoma of the uterus, cervix, breast, penis, thyroid, adrenal pancreas, lung, stomach, gallbladder and colon as well as four cases of sarcoma were included in the group. Carcinoma of the colon was present in seven of the thirty-four cases, the largest number in a single organ. Isaacson and Rapoport[1] concluded from their study that the occurrence of eosinophilia with malignant tumors was usually indicative of dissemination and a poor prognosis.

Stickney and Heck[2] in 1944, in a general discussion on eosinophilia in which more than 6 per cent of the leukocytes are eosinophils, reported on a total of 418 cases. In tabulating the cases by degree of eosinophilia, they found malignant lesions in 5 per cent of the group in which 6 to 10 per cent of the leukocytes were eosinophils, 1.3 per cent of the group with 10 to 20 per cent eosinophils and in 4 per cent of the group with 20 per cent or more eosinophils. The type of malignant tumor was not specified in this report. Grewe and Schlitter[3] in Berlin in 1954 found among 800 cases of tumor 197 instances of eosinophilia in which more than 5 per cent of the leukocytes were eosinophils.

The cause of eosinophilia associated with malignant tumors remains obscure. Necrosis of the primary tumor or of a metastatic lesion is considered by most workers to play some role in the production of eosinophilia. It is postulated that the necrotic malignant tissue liberates protein degenerative products to which the individual has an allergic susceptibility. Although necrosis may be responsible in some way for the eosinophilia in many cases, this mechanism does not always explain the cause. Hepatic metastasis is frequently found when malignant disease is associated with eosinophilia, but the liver is not involved in all cases. The role of the liver in the production of eosinophilia is still poorly understood.

The final point of interest in this case was the leukemoid blood picture, which superficially at least might have been confused with leukemia. Metastatic malignancy, particularly when bone is involved, results in a peripheral blood picture that includes anemia, myeloid immaturity and normoblastosis. The common morphologic changes are increased rouleaux formation, toxic changes in the polymorphonuclear leukocytes, a scattering of immature myeloid cells, and one or more normoblasts. Anemia when present is ordinarily normochromic and normocytic. Low-grade leukocytosis is most commonly found, although fairly high counts can occur. In a patient with a known malignant tumor, the finding of this sort of peripheral blood picture must be regarded as evidence that the malignant tumor has metastasized, in the absence of other possible causes.

Aspiration of bone marrow may provide the simplest and most practical method of establishing the diagnosis. The importance of finding clumps of cells foreign to the marrow in smear preparations should be emphasized before a morphologic diagnosis is made. Diagnoses from single cells should be avoided. Confirmation can usually be obtained by examination of paraffin-fixed sections of bone marrow.

Summary

A case of carcinoma of the rectum is presented which is of interest because of the high degree of eosinophilia associated with it. Additional points

(Continued on Page 120)

Seminar

THE SYSTEMIC MYCOSES

MATTHEW B. DIVERTIE, M.B., Ch.B.
and CORRIN H. HODGSON, M.D.
Rochester, Minnesota

THE systemic fungous diseases are classified pathologically as infectious granulomas and present the same problems in diagnosis and treatment as do other members of this group, with certain additional difficulties due to their own characteristics. The deep mycoses are not contagious. With the exception of the less common acute forms, they tend to be insidious in onset and pursue a slow and smoldering course in which spontaneous remissions may occur. The diagnosis of tuberculosis is made fairly frequently in these conditions, for much of the clinical and laboratory evidence tends to be nonspecific and often misleading. It is becoming increasingly common for so-called tuberculomas to be later renamed granulomas, from which Histoplasma capsulatum, Coccidioides immitis or other fungi can be isolated.

The systemic mycoses form a circumscribed group because, with the exception of true actinomycosis, each of these diseases is caused by a single species of organism. Nevertheless, partly due to the inherent ability of these organisms to adapt themselves biochemically and morphologically to changes in their environment and partly due to failure to recognize the prevalence of these infections, treatment has not shown spectacular advances. Many agents that inhibit or kill the organisms successfully *in vitro* have proved to be too toxic when used in human patients in comparable doses. In the last few years, however, some promising agents have been used with good results in treating members of this group. Since wide-spectrum antifungal agents do not exist at present, it is essential that a precise and definitive diagnosis is reached before treatment is undertaken.

For supporting evidence on which to base a diagnosis, the antibodies responsible for the state of hypersensitivity that develops in most mycotic infections may be detected by the use of cutaneous tests or may be quantitatively assessed by agglutination, precipitation or complement-fixation reactions. Once acquired, cutaneous sensitivity persists for many years and is then of little help in indicating the activity or quiescence of the disease. False positive results are frequent in sensitized persons if a high concentration of antigen is used, a circumstance that also favors a greater incidence of cross reactions, especially between blastomycin, histoplasmin and coccidioidin. False negative results often appear as an exhaustion phenomenon in the terminal stages of the disease, and the loss of established cutaneous sensitivity in known active mycotic infections may be of grave prognostic import, particularly if this is accompanied by increasing titers in the results of serologic tests. When difficulty exists in interpreting the results of cutaneous tests, help can be obtained from the serologic tests, a high titer indicating homologous cutaneous reactions and a low titer indicating that they are heterologous. Nevertheless, it is important to realize that these studies produce results which, at best, can be regarded only as suggestive or supportive. A diagnosis never should be made solely on the outcome of such tests.

Diagnostic evidence of a more direct nature is obtained from the microscopic examination of sections of tissue. The use of the periodic acid-Schiff stain has proved most effective in the identification of fungi in such specimens, although Gram's stain is to be preferred in demonstrating Actinomyces and Nocardia, whose filaments are gram-positive. Nevertheless, histologic examination has its limitations and various forms of Blastomyces dermatitidis, C. immitis and B. brasiliensis have been confused by experienced

---

Dr. Divertie is a Fellow in Medicine, Mayo Foundation, and Dr. Hodgson is from the section of medicine, Mayo Clinic and Mayo Foundation.

The Mayo Foundation, Rochester, Minnesota, is a part of the Graduate School of the University of Minnesota.

mycologists. Inoculation of animals is of uncertain outcome and the most effective step in diagnosis is growing the organism on cultures made from pathologic material. Blood agar has been found to be the most satisfactory medium, with the addition, when necessary, of such antibiotics as streptomycin and penicillin to suppress bacterial contaminants. More specific media are required for certain fungi whose growth characteristics tend to be more fastidious. Final identification of the infecting agent rests on the results of culture of infected material, which should be sent to a laboratory properly equipped for the culture of fungi.

As far as general treatment is concerned, the iodides have remained the most useful therapeutic tool for many years, supported by more specific measures when such are available. Iodides may be administered orally as potassium iodide, intravenously as sodium iodide or by inhalation as ethyl iodide. Only in sporotrichosis can the iodides be regarded as specific.

Diseases Caused by Actinomycetaceae

The family Actinomycetaceae contains a varied group of organisms with characteristics intermediate between those of bacteria and fungi. They are world-wide in distribution and, before the advent of antibiotics, were responsible for the commonest of the systemic fungous infections in man. Two genera of medical importance are known. One is the parasitic, anaerobic and non-acid-fast Actinomyces and the other is the genus Nocardia, which includes organisms that are saprophytic, aerobic and variably acid-fast. Differences occur in the type of human infection that each produces.

Actinomycosis.—Human actinomycosis is caused by Actinomyces bovis or A. israeli, organisms that may be found around carious teeth, in the crypts of tonsils and in the gastrointestinal tract. They produce lesions characterized by fibrosis, the formation of granulation tissue, abscesses and multiple sinuses discharging pus in which the typical "sulfur granules" may be found. These granules are not invariably present; even when they are found, it is advisable to demonstrate the gram-positive filaments of the organism before one is certain of the diagnosis. Culture readily distinguishes the anaerobic Actinomyces from the aerobic Nocardia.

Sites of infection are in the cervicofacial region, the abdomen and the thorax in that order of frequency. In the face and neck, this disease often follows an old infection or the extraction of a carious tooth. Soft-tissue swelling, with lumpy wooden hardness and redness of the overlying skin, terminates in the development of discharging sinuses and possible involvement of bone. The abdominal form is commonest in the ileocecal region, where it may cause features suggesting acute or subacute appendicitis, with the formation of a hard mass in the right lower quadrant. Vertebral and hepatic infection, cutaneous involvement and spread to the thorax may follow. While ingested organisms are presumed to cause abdominal infection, the aspiration of the fungus is the commonest cause of thoracic actinomycosis. Pulmonary lesions tend to occur bilaterally in the lower part of the lung fields, and the mediastinum is frequently involved. A hilar mass may simulate neoplasm. The symptoms are those of a mild nonspecific respiratory infection, with the production of blood-streaked mucopurulent sputum containing the infecting organism. Pleural involvement may be part of the picture and purulent effusion may develop but more frequently the thoracic wall is invaded directly and the familiar sinuses appear, discharging their pus on the surface of the skin.

Surgical exploration of the sinus tracts should be undertaken to permit adequate drainage; excision of as much diseased tissue as possible should be accomplished, including intestinal and pulmonary resection. Penicillin in large doses over a prolonged period is the drug of choice, either by itself or in combination with a sulfonamide. Patients who have not improved after this type of chemotherapy or who have relapsed after a suitable course of treatment may respond to administration of streptomycin, chlortetracycline (aureomycin), oxytetracycline (terramycin) or chloramphenicol in large doses given for long periods. Stilbamidine also has been reported to be successful in resistant actinomycosis.[1]

Nocardiosis.—Systemic nocardiosis is chiefly pulmonary in origin, the infecting agent being Nocardia asteroides. This fungus occurs freely in nature as a saprophyte, but it causes a pulmonary infection in man that resembles tuberculosis, with subsequent pyemia and formation of multiple abscesses in the lungs, brain, subcutaneous tissue and muscles. From the two last-named sites, sinuses may drain pus onto the skin but, unlike the situation in actinomycosis, sulfur granules are seen infrequently. Not only does nocardiosis closely simulate pulmonary tuberculosis clinically but the roentgenologic appearances of the thorax are also similar and the organism is often found in a bacillary acid-fast form in sputum, pus, cerebrospinal fluid and fluid from empyema. Culture of pathologic material is the definitive method of diagnosis. Results of serologic and cutaneous tests are of little diagnostic value in human nocardiosis.

Treatment is directed along the lines already indicated for actinomycosis, but the use of sulfonamides in nocardiosis is specific. Administration of large doses should be maintained for a considerable period and continued for several months after apparent cure of the disease. Although aureomycin and chloramphenicol have been shown to be more effective than sulfadiazine *in vitro,* they were of much less value in *in vivo* studies in mice.[2]

North American Blastomycosis

First described by Gilchrist, in 1896, this disease is limited to North America and has a geographic predilection for the region of the Mississippi River valley and the southeastern part of the United States. The source of infection and the mode of transmission remain obscure but the causative agent is Blastomyces dermatitidis, a fungus that grows well on all laboratory media in common use. The disease is a chronic cutaneous or systemic or combined cutaneous and systemic infection in which the most characteristic reaction to the organism is the production of abscesses and chronic inflammation, with formation of scars.

The primary cutaneous form appears commonly on an exposed surface of the skin, particularly the face and upper limbs. The first evidence of infection is a papulopustule that slowly spreads peripherally to form a sloping purplish-red border studded with miliary abscesses, from which pus may be obtained for examination and culture. Ulceration of the center is followed by scarring, and the disease may persist in this form for many years. Hematogenous and lymphatic spread rarely occurs from these lesions; however, should it do so, the prognosis is as grave as it is in systemic spread from any other site.

As is frequently the case in the disseminated form of the deep mycoses, the site of primary infection in systemic blastomycosis is usually the respiratory tract. There is nothing specific about the onset of the disease, for the clinical picture is that of a mild respiratory infection with low-grade fever and a failure to regress. Over a period of weeks or months, symptoms of toxicity develop, and purulent sputum with attendant hemoptysis is a prominent feature. Evidence of widespread lesions in other organs finally becomes apparent, the principal sites being the skin, subcutaneous tissue and bone, of which the vertebrae and ribs are involved most often. The cutaneous lesions at this pyemic stage resemble those of the primary cutaneous form. Liver, spleen, kidneys, central nervous system and prostate are commonly infected but, in contrast to histoplasmosis and South American blastomycosis, the gastrointestinal tract is usually spared.

The mediastinum is almost invariably involved. Pulmonary lesions at first tend to be unilateral and their roentgenologic appearance may suggest that of carcinoma. As the disease progresses, cavitative or miliary tuberculosis may be simulated.

While positive cutaneous and complement-fixation reactions are valuable presumptive evidence of blastomycosis, cross reactions with histoplasmin and coccidioidin are common. If simultaneous testing with all three antigens is carried out, the true condition is usually indicated by the most pronounced cutaneous reaction. Similarly, a homologous serologic reaction will be manifested by a high titer, whereas a low titer indicates a heterologous reaction. Final diagnosis rests on the demonstration of B. dermatitidis by culture of sputum, gastric washings, pus, cerebrospinal fluid, tissue obtained for biopsy and other pathologic material.

Use of the iodides combined with electrocautery or roentgen therapy has been the prescribed plan of treatment for many years, but recurrence has been common. Of the many other agents listed, only aureomycin appears to have any pronounced inhibitory effect on the organism but even prolonged administration apparently does not produce sufficient concentration to eradicate the organism from the tissues. Other antibiotics have proved of little value. In 1948, however, it was found that one of the aromatic diamidines in low concentration caused inhibition of the growth of pathogenic fungi *in vitro*.[3] This was stilbamidine, a drug that has been used for many years in the treatment of kala-azar and that has been given with variable success in the management of multiple myeloma. Clinical trials of this drug in the treatment of the mycoses have been most encouraging.[4]

The chemical analogue 2-hydroxystilbamidine has an equivalent inhibitory effect on the growth of B. dermatitidis and good results have followed its clinical use in systemic blastomycosis. It shows no significant change after exposure to ultraviolet light and does not produce trigeminal neuropathy even after sustained administration. As with stilbamidine, however, it should be used cautiously in the presence of renal or hepatic damage. Use of 2-hydroxystilbamidine undoubtedly is the treatment of choice in systemic North American blastomycosis. It should be given intravenously in a 5 per cent solution of glucose by slow drip and in divided courses. *In vitro* studies of various antihistamines, of diethylaminoethyl fencholate and of diethylstilbestrol have shown these substances to be satisfactorily inhibitory for B. dermatitidis. Unfortunately, *in vitro* trials and clinical results are not always parallel but diethylstilbestrol has been used effectively in the treatment of cutaneous North American blastomycosis. Isolated pulmonary lesions are suitably treated by surgical resection.

South American Blastomycosis

This disease occurs most commonly in Brazil and is almost confined to South America, although one case has been reported from Costa Rica[5] and an account of the first recorded instance in the United States has been published recently.[6] The latter patient was a resident of Oregon who had worked for a time in Venezuela. This form of blastomycosis is principally a disease of rural communities, although the fungus has not been isolated from the soil and natural infection in animals has not been demonstrated. The causative agent is B. brasiliensis, a multiple budding fungus that in certain forms is readily confused microscopically with B. dermatitidis. Cultures from infected material may be made readily on all common laboratory media, although growth is characteristically slow.

Coccidioidomycosis

Coccidioidomycosis is a dust-borne disease of the dry regions of the southwestern part of the United States, with its greatest prevalence in the endemic regions of the San Joaquin valley and other parts of California, Arizona, Texas, New Mexico, Utah and Nevada. It also occurs in parts of Central and South America. The causative agent, Coccidioides immitis, contaminates the soil in these endemic zones and is probably breathed into the lungs in dust during the dry summer and autumn months.

This primary infection is symptomless in a large proportion of cases, and only a positive cutaneous reaction to the injection of coccidioidin remains as evidence of contamination. If symptoms do develop, they follow an incubation period of about two weeks and are the nonspecific features of any febrile respiratory infection, in which pleural pain with or without attendant effusion also may be present. This picture often is followed in a week or so by the development of allergic manifestations in the form of erythema nodosum, erythema multiforme, phlyctenular conjunctivitis or arthritis of the knees and ankles. These signs of sensitization, which may develop after the asymptomatic form of primary infection, are associated with a good prognosis and systemic spread rarely occurs after they appear. Roentgenologic findings are extremely variable and films may show a midzone pneumonic process or circumscribed nodular lesions that may resolve, persist as large thin-walled cavities or undergo final calcification. Hilar or mediastinal glandular enlargement or minor degrees of pleural effusion also may be seen. Ulcerative nodular cutaneous lesions and lymphadenopathy, especially of infected nodes in the neck, either heal or progress to the systemic form of the disease. They form a nonpulmonary type of primary coccidioidomycosis.

Systemic spread of the disease occurs weeks or months after the primary infection. It is a relatively infrequent sequel of initial infection but it occurs with much greater frequency in colored persons than among Caucasians. The prognosis is grave and the expectation of life is little more than a year at the most. Symptoms of toxicity, high fever, wasting and occurrence of mucopurulent sputum appear as the organism spreads to infect subcutaneous tissue, bones, testes, meninges and the viscera, with resultant formation of abscesses at these sites. The gastrointestinal tract is usually spared.

Results of precipitin and complement-fixation tests remain negative in asymptomatic and mild primary coccidioidomycosis but in severe primary infection the precipitin reaction becomes positive, reverting to negativity after a month or so. Complement-fixing antibodies appear late in severe primary infection and should disappear in a few weeks' time. Progressive increase in titer is good evidence of systemic spread. Results of skin tests with coccidioidin also become positive in all severe primary infections, and the cutaneous reaction thus induced may produce or aggravate the allergic symptoms attending the disease. As noted previously, cross reactions with blastomycin and histoplasmin may occur, and means for differentiating the three diseases already have been discussed. Confusion between inactive forms of C. immitis and B. dermatitidis may occur on microscopic examination of infected material. Culture of pus, sputum, gastric washings, cerebrospinal fluid, tissue taken for biopsy or other pathologic material provides the final diagnosis.

Large cystic cavities present in the lungs may be treated surgically, especially if recurrent hemorrhage occurs from them. Depending on the size, number and location of such lesions, anything from wedge resection to pneumonectomy may be required. Medical treatment of the primary form consists of rest in bed and supportive therapy, with adequate assurance that the leukocyte count, erythrocytic sedimentation rate, clinical and serologic findings and roentgenologic appearances have returned to normal before everyday activity is resumed.

In treatment of the systemic form of the disease, many drugs, including iodides, various dyes and heavy metals and antibiotics have been tried without success. Recent *in vitro* studies have shown that stilbamidine, certain antihistaminic drugs, actidione, prodigiosin, ethyl vanillate, methyl testosterone and the more toxic protoanemonin possess promising inhibitory properties. Clinical trial of protoanemonin did not produce encouraging results[7] but the use of prodigiosin, a purple dye extracted from cultures of Serratia marcescens (Bacillus prodigiosus) by organic solvents, has shown good results in six of fourteen patients, of whom five were moribund before treatment was commenced.[8] In general, those who showed improvement or arrest of their disease showed an absence of organisms in cultures in two weeks and healing of abscesses in about a month. Arrest of the disease was obtained in one patient who had systemic coccidioidomycosis treated with a combination of methyl testosterone and sulfonamides.[9]

Cryptococcosis

Cryptococcus neoformans, also known as Torula histolytica, causes a subacute or chronic infection of the central nervous system in man, although the lungs, solid viscera, skin and, occasionally, bone also may be attacked. This fungus occurs in nature as a saprophyte and may be isolated from the soil in many widespread regions throughout the world. Because it is a budding fungus, the infection it causes sometimes is designated "European blastomycosis," which is a misnomer in view of the fact that the disease is of world-wide incidence. The organism is one of the most indolent of the fungi, and chronic inflammatory changes and formation of pus are rarely caused by its presence. The typical lesions have a characteristic gelatinous character, with cystlike zones present in the substance of the brain from which the thick-walled budding fungus with its wide refractile capsule can be recovered. Culture of cerebrospinal fluid, sputum, gastric washings, exudates or tissue taken at biopsy on Sabouraud's medium or blood agar provides the final diagnosis. Cutaneous and serologic tests are of no help in evaluating the individual case, although specific polysaccharides have been demonstrated in the capsule of the organism.

The mode of entry of this fungus into the body is uncertain but the respiratory tract is the most likely pathway, although the skin, nasopharynx and other tissues have been incriminated. Primary or secondary cutaneous forms appear as acneiform or ulcerative lesions, while subcutaneous tumors or enlarged lymph nodes may be found, especially in the systemic form of the disease. The primary cutaneous lesions may heal spontaneously or later spread to initiate systemic dissemination of the fungus. The pulmonary form has little specificity in the way of symptoms to raise suspicion of its cause. It tends to be bilateral, although unilateral lesions may be encountered and are then suitable for surgical resection. The roentgenologic appearances are usually confused with those of neoplasm or tuberculosis, although cavitation is not frequent. Miliary lesions are noted with widespread infection, although neither mediastinum nor bone is involved in most instances, a feature that is in sharp distinction to the findings in actinomycosis, coccidioidomycosis and North American blastomycosis.

The usual form of cryptococcosis involves the central nervous system and is probably always secondary to a site of infection elsewhere in the body, in most instances the lungs. Its characteristics are those of any subacute or chronic meningoencephalitis, with the features of severe headache, nuchal stiffness, vomiting, palsies of various cranial nerves and mental disturbances of severe degree. Death occurs in a few weeks or months from respiratory failure. Cryptococcosis is a systemic disease attended in its course by remissions of variable length and with the local manifestations already mentioned.

These natural remissions make it difficult to assess the efficacy of new forms of treatment. Treatment has been unsatisfactory and the sulfonamides do not appear to have fulfilled their early promise. Iodides and penicillin are of little value, and vaccines also have failed to influence the course of the infection. Streptomycin and quinacrine hydrochloride (atabrine) have been too toxic in the doses required. Protoanemonin, a synthetic lactone that is effective in the treatment of local lesions, has produced neurotoxic symptoms severe enough to preclude its use in systemic disease. A potentially more promising development has been the isolation of substances from the broth of cultures of Bacillus subtilis or of Pseudomonas aeruginosa that inhibit the growth of C. neoformans *in vitro*. Several antihistaminic compounds, as well as the afore-mentioned antifungal agent diethylaminoethyl fencholate, have similar well-marked *in vitro* properties and may be worthy of clinical trial.

Actidione, a substance isolated from culture filtrates of Streptomyces griseus that, unlike streptomycin, is soluble in organic solvents, apparently has produced favorable effects on the course of proved cryptococcosis, although unequivocal cures have not been reported.[10] Although the temperature curves and clinical courses were slightly improved in a series of ten treated patients, most of them died. In two others, the cerebrospinal fluid remained sterile for two months after treatment with actidione.[11] These results are neither substantial nor sustained but, for want of a better drug, actidione may still continue to be used in this disease. Nausea and vomiting have been the only observed side effects. The use of fever therapy has been suggested as an adjuvant, since a higher body temperature artificially induced in mice has been shown to enhance their resistance to infection by cryptococci.[12]

Good results have been obtained after the surgical resection of focal pulmonary lesions when the stigmas of systemic dissemination could not be found.

Histoplasmosis

It was noted about a decade ago that many people living in the central Mississippi River valley and in the Ohio River valley had extensive pulmonary calcification with negative cutaneous reactions to tuberculin and coccidioidin but positive cutaneous reactions to histoplasmin. It is now accepted that histoplasmosis is not the invariably fatal condition it once was thought to be. In fact, it closely resembles coccidioidomycosis in being a highly infectious primary pulmonary disease that often is asymptomatic and that undergoes systemic dissemination in a minority of cases. Pulmonary calcification is a common sequel and tends to be diffuse and bilateral. It may be confused with healed tuberculosis or coccidioidomycosis.

The offending agent is Histoplasma capsulatum, an organism of world-wide incidence that has been isolated from the soil of endemic zones. It has a special affinity for the cells of the reticuloendothelial system, the disease thus being a reticuloendothelial cytomycosis. Cryptococcosis, North American blastomycosis and tuberculosis have been found in association with histoplasmosis, and it would appear that a reinfection or reactivation form of histoplasmosis may occur. After entrance of the organism, cutaneous reactions to histoplasmin become positive and persist probably for life. Complement-fixation tests on the other hand regress from a positive reaction in high titer early in the infection to a negative reaction. Roentgenograms show multiple scattered pneumonic or nodular zones in both lung fields and hilar adenopathy in the majority of cases. Pulmonary lesions occasionally are localized to one or two regions of a lung and may be amenable to surgical removal after the primary phase has passed. As already mentioned, multiple calcified foci are the residual evidence of infection by H. capsulatum.

The systemic form of the disease may follow a minority of primary pulmonary infections, but the primary site frequently occurs in the oropharynx or skin, where papules, plaques or punched-out ulcers are the common lesions. The intestinal tract also is a frequent portal of entry, especially in young children, with resultant ulceration of the lymphoid tissue of the small intestine. The clinical features of lymphadenopathy, hepatomegaly and splenomegaly are associated with pyrexia, emaciation, diarrhea, anemia and leukopenia. Involvement of the central nervous system and the development of solitary bony lesions are rare, although the organism can be obtained almost invariably on culture of the bone marrow. Even in the presence of widespread lesions, present opinion would lead to the belief that healing still may take place but, in general, the prognosis is extremely grave. A fading cutaneous reaction to histoplasmin and an increasing antibody titer are considered by some as indicative of serious progressive disease.

The organism can be obtained on culture of sputum, gastric washings, bone marrow, peripheral blood, tissue procured during biopsy of lymph nodes and other infected tissue on the usual media. Cross reactions may occur with blastomycin and coccidioidin in cutaneous testing but, as already mentioned, the largest reaction occurs with the homologous antigen. The same principle is followed in determining specificity when cross reactions take place in serologic tests.

Many agents have been tried in the treatment of histoplasmosis but none has met with unqualified success. The ethyl ester of vanillic acid inhibits the growth of H. capsulatum *in vitro.* Its greatest effect in animals occurs when it is given orally, suggesting that its main activity and possibly its toxicity are due to breakdown products of the drug. Toxic doses in mice cause inflammatory changes of the upper part of the gastrointestinal tract and glomerular and tubular damage in the kidneys, together with fatty degeneration and focal necrosis in the liver, toxic myocarditis and generalized capillary engorgement. The toxic dose in mice is one half its therapeutic dose. It causes drowsiness and apathy in infants; these symptoms disappear when administration of the drug is discontinued. Serious hyperventilation alkalosis of the type seen in adult encephalitis lethargica occurs in some children who are given this drug. Necropsy on persons thus treated who have died of histoplasmosis shows hepatic and renal changes similar to those found in laboratory animals. Despite these disadvantages and the added hazard of a narrow margin between toxic and therapeutic doses, ethyl vanillate has shown good results in some of the cases reported.[13] However, for the reasons already mentioned, interest in therapy with ethyl vanillate is diminishing. It is too toxic to use for any patients except those who otherwise face certain death.

Reports have been made of successful treatment of disseminated histoplasmosis with a combination of methyl testosterone and sulfonamides, with no toxicity noted during prolonged treatment.[9] Aspermia may be produced but this is reversible, as is the physiologic creatinuria resulting from its use. Jaundice was not present in the two cases reported. Report of a case in which diethylaminoethyl fencholate was employed leaves the efficacy of this drug in doubt, as other factors may have encouraged the healing process. It is not toxic and its *in vitro* inhibition of H. capsulatum is undoubted.[14] Antihistamines produce a similar effect in laboratory tests. Clinical trial of stilbamidine would not indicate any prolonged effectiveness of this drug in histoplasmosis.

As in the other systemic mycoses with isolated pulmonary lesions, surgical resection is the treatment of choice if no trace of further spread can be found.

Sporotrichosis

This is the only systemic mycosis in which iodides can be said to be specific. It is caused by Sporotrichum schenckii, which has been isolated from many natural sources, particularly soil, wood and plants, in all parts of the world. Infection follows trauma to the skin. Although the disease has been acquired from animals, there is no suspicion of spread from man to man. Unlike the other systemic fungous infections, the lungs are rarely, if ever, the site of primary infection, even in the disseminated form of the disease. The characteristic features of the localized infection make its clinical diagnosis an easy matter, but it is virtually impossible in most cases to demonstrate the presence of the fungus either in sections of tissue or on microscopic examination of pus or infected material. Culture on Sabouraud's medium or blood agar is sufficient to provide the diagnosis, and the organism grows with ease. Antibodies can be detected in the serum by agglutination, precipitation and complement-fixation tests, and positive cutaneous reactions are obtained after the injection of a heat-killed vaccine or specific polysaccharide. These tests, however, are of more academic than practical importance. Prognosis is good except in the rapidly disseminated form and in the visceral type of disease.

In the commonest form of the disease, an exposed limb, most often the arm, becomes infected following trauma to the skin, in which wood, especially the barberry thorn, is frequently the incriminated agent. The primary lesion, granulomatous in nature, develops in the subcutaneous tissue at the site of injury and later involves the skin. Subsequently, the regional lymphatic vessels are involved, along the course of which ulcerating nodules occur; enlargement of the related lymph nodes takes place later. Thin pus ultimately is discharged from the ulcerating lesions, but dissemination rarely occurs. A polymorphous epidermal type of involvement also may be found.

The disseminated form of the infection, in which pulmonary involvement does not always take place, may be encountered without any primary site of infection being defined. Hard subcutaneous nodules appear over the surface of the body. These may enlarge but do not often ulcerate. The solid viscera may be involved, the most commonly affected being the kidneys, testes and epididymides. The bony skeleton is rarely a site of pathologic change in this condition but mucous membranes, especially of the oropharynx, often are involved in the disseminated form and also may be the seat of primary disease. Final diagnosis rests on culture of the organism from infected material.

Iodides are specific in sporotrichosis and some authorities consider that their action is a selective one on the fungus itself. Others think that they exert their action by stimulating a fibroblastic reaction and encapsulation of the organism. In the few instances of disease that is resistant to iodides, success has been reported after the use of sulfonamides, although other treatment has been favorably mentioned, including hyperthermia. Promising results were obtained after use of 2-hydroxystilbamidine in systemic sporotrichosis in mice but clinical trial produced more equivocal results in the one human thus far treated.[15] Surgical excision of local lesions is contraindicated, as it is followed so frequently by prolonged suppuration, but roentgen therapy in semi-intensive filtered doses is useful in the treatment of these surface granulomas.

Comment

It is not within the scope of this presentation to debate whether or not organisms of the genus Candida produce systemic infection in man. This fungus is such a well-known contaminant of devitalized tissue in all parts of the body that doubt has been cast on its ability to cause primary systemic involvement. Since the commonest manifestations of its pathogenicity occur in readily accessible and relatively localized regions, recognition is seldom difficult and treatment is confined to topical applications.

It is advisable to regard the use of cortisone in the systemic mycoses with benign suspicion at present, as it is uncertain how harmful its effects may be in allowing spread of the disease. On the other hand, it has been suggested that it may be of some value in tiding the patient over the initial acute phase of the illness.

The systemic fungous infections remain as diseases of protean clinical manifestations that are attended in most instances by a chronic course and in which final diagnosis depends on the cultural characteristics of the causative agent. It is extremely doubtful that any universally effective antifungal agent will emerge, at least in the foreseeable future.

References

1. Miller, J. M., Long, P. H., and Schoenbach, E. B.: Successful treatment of actinomycosis with "stilbamidine." J.A.M.A., 150:35 (Sept. 6) 1952.
2. Strauss, R. E., Kligman, A. M., and Pillsbury, D. M.: The chemotherapy of actinomycosis and nocardiosis. Am. Rev. Tuberc., 63:441-448 (Apr.) 1951.
3. Schoenbach, E. B., and Greenspan, E. M.: The pharmacology, mode of action and therapeutic potentialities of stilbamidine, pentamidine, propamidine and other aromatic diamidines: review. Medicine, 27:327-377 (Sept.) 1948.

(Continued on Page 120)

Current Concepts

SMOKING AND THE CARDIOVASCULAR SYSTEM

GRACE M. ROTH, Ph.D.
Rochester, Minnesota

Today one of the major medical questions is, Does smoking really have an effect on the cardiovascular system of a man in good health? To answer this question, 425 standard smoking tests were carried out on 100 normal individuals. One would suspect little difficulty in determining the effect of smoking tobacco on the circulation of normal individuals. However, all methods of measuring blood flow in man are indirect. Some of the confusion in the results of smoking tests has arisen because too little attention has been paid to certain factors during measurement of peripheral blood flow. The most important of these factors are, (1) the environmental temperature, (2) the position of the subject, particularly the extremities, (3) the taking of food and (4) the basal metabolic rate. All must be considered whenever measurements of peripheral blood flow are made. The standard smoking test, as finally devised, used the skin temperatures as a measurement of blood flow, took into consideration the four factors just listed and also required simultaneous observations of blood pressures and pulse rates.

Sixty-six standard smoking tests* were carried out on six normal subjects, four physicians and two women technicians whose basal metabolic rates ranged from —17 to +1 per cent. These studies showed that the responses to smoking of the skin temperature of the same individual varied from day to day according to the basal metabolic rate, but the increase of the blood pressure and pulse rate during smoking varied little from day to day. Thus it was necessary to determine the basal metabolic rate and skin temperatures for each study. The skin temperature of the toes of all the subjects decreased an average of 2.5°C. (4.5°F.) with a range from 1° to 4°C. (1.8° to 7.2°F.) For the fingers the average decrease was 3.2°C. (5.8°F.). The average increase of blood pressure during smoking was 20 mm. Hg systolic and 14 mm. Hg diastolic. The pulse rate increased an average of 36 beats per minute ranging from 20 to 52 beats. The electrocardiographic changes consisted of increased heart rate, decreased amplitude of T waves with inverted T waves in one instance.

Habitual smokers did not show tolerance to the effects of smoking as the skin temperatures of the extremities decreased and the blood pressure and pulse rate increased. The decrease of the skin tmperature was not related to the length of time the subject had been a smoker or the number of cigarettes smoked a day.

Additional tests were necessary to determine whether the vascular changes were due to nicotine. Two groups of tests were made. (1) Normal subjects received a solution of sodium chloride intravenously as a control and then 2 mg. of nicotine was added to the solution without the subjects' knowledge. Here again the skin temperatures decreased rapidly and definitely, the heart rate increased and the amplitude of the T waves decreased. (2) Thirty smoking tests were carried out with various commercially available denicotinized cigarettes. The vascular effects were similar to those obtained when standard cigarettes were smoked. In order to determine how much the content of nicotine in a cigarette should be decreased to bannish the vascular effects, 192 standard smoking tests were done on 29 normal subjects between the ages of twenty and thirty-six years. Six different batches of cigarettes were

(Continued on Page 114)

From the Section of Physiology, Mayo Clinic and Mayo Foundation, Rochester, Minnesota.
The Mayo Foundation, is a part of the Graduate School of the University of Minnesota.

*Two-thirds of two cigarettes were smoked and inhaled with the individual's accustomed depth and frequency.

Continuation Studies

GENETIC AND FAMILIAL ASPECTS OF CENTRAL NERVOUS CONDITIONS IN CHILDREN

RAY C. ANDERSON, Ph.D., M.D.
Minneapolis, Minnesota

SO numerous and varied are the hereditary diseases of the central nervous system in children that an intensive course in human genetics could be fashioned around them. Unfortunately, there still is considerable disagreement regarding the identification and classification of such diseases. Many of the present-day recognized "entities" will undoubtedly prove to be groups of independent diseases. Genetic studies will very likely help in clarifying the multiple nature of such conditions.

There has been confusion in the past regarding genetic terminology, and this has been perpetuated by the majority of medical textbooks. Thus, the term "hereditary" was formerly used to designate dominant inheritance, in other words, the appearance of a particular trait in successive generations. "Familial" was used to indicate the multiple occurrence of a trait in siblings. "Hereditary" should instead be used to indicate that the trait in question is due to biochemical units which are customarily identified as genes. On the other hand, "familial" can be used to describe the greater-than-chance clustering of traits in families, regardless of whether heredity or environment is responsible for this phenomenon.

We can group the various diseases and anomalies into various categories according to their patterns of inheritance. On the one hand, we have several rather rigid types of genetic behavior, and on the other, what we might call "hereditary tendencies."

Ninety years ago, Gregor Mendel identified the patterns of dominant and recessive inheritance. Much has been learned since, particularly with regard to the nature of the underlying particulate bodies, the chromosomes and genes, but his basic principles continue to guide genetic thinking. Man has twenty-four pairs of chromosomes, twenty-three pairs being "autosomes" and one pair being "sex chromosomes." The latter pair consists of two "X" chromosomes in the female, and an "X" and a "Y" chromosome in the male. Like the chromosomes that "carry" them, the genes occur in pairs, the two paired genes being termed "alleles." Although "dominance" and "recessiveness" are now viewed as something less than absolute, we still find these terms to be of practical value.

A dominant gene is defined as one which produces its effect regardless of the nature of its gene-mate (allele). The "effect" will appear in all individuals possessing the gene. Muscular dystrophy of the facioscapulohumeral form often occurs as a dominantly inherited disease. An affected individual in such a case will pass the predisposing gene on to 50 per cent of his children, who in turn will develop the disease in adolescent years. In some dominant diseases, the bearer of the gene may sometimes not exhibit the trait. This is termed irregular or incomplete dominance, or lack of "penetrance." Thus, in epiloia (tuberose sclerosis) there will be a spotty appearance of the condition in the family pedigree. In such families there will be outwardly ("phenotypically") normal-appearing individuals, some of whom are inwardly ("genotypically") normal and some who are genotypically abnormal. Only the latter "normals" have the predisposing gene available to pass on to the next generation.

A recessive gene is defined as one which produces an effect only when present in double dose. In other words, the dominant allele must be absent. The bearer of a double dose must of course have obtained one such gene from each parent. The parents in such cases will usually appear normal, since they will ordinarily possess

---

From the Department of Pediatrics, University of Minnesota.

Presented at the University of Minnesota Continuation Course in Pediatrics, September 21 and 22, 1955.

but one dose of the genes involved. Siblings subsequently born will have a one-in-four chance of getting a double dose of the gene. Since families are now usually small, recessively-determined hereditary diseases are frequently sporadic (only one in a family). It is in this type of inheritance that the parents search in vain for a taint in the family tree. When they learn that each of them evidently carried the predisposing gene, they are often relieved to know that neither one is solely to blame for the misfortune. Phenylpyruvic oligophrenia (phenylketonuria), a type of severe mental deficiency, is a classical example of this type of inheritance. Diagnosis of this disease is made by the testing of urine with ferric chloride. Recessively inherited traits are more likely to appear in marriages of blood relatives, since in such cases the parents tend to have more genes in common, the bad as well as the good.

A sex-linked gene is defined as one located on the sex chromosome. Such genes are usually recessive and usually located on the X-chromosome. This pattern of inheritance has been given widespread publicity because it is the pattern of inheritance shown by hemophilia. Female carriers of the gene appear normal since they ordinarily have a normal "cover-up" dominant allele present. The female passes the sex-linked gene on to 50 per cent of her sons, who then develop the trait because their Y-chromosome contains no cover-up allele. Progressive muscular dystrophy of the childhood type demonstrates clearly this pattern of inheritance. As the clinician is well aware, affected individuals are almost always boys. The few cases that do appear in girls may well represent a different entity. Gargoylism, though rare, has proved interesting in this respect, since it too is more common in boys. Clinically and genetically there appear to be two types of gargoylism, one type with corneal clouding and autosomal recessive inheritance, and another type with no corneal clouding and sex-linked recessive inheritance. Other types of sex-linked inheritance result if there is a dominant gene on the X-chromosome or if there is a gene on the Y-chromosome (the latter pattern then being from father to son, so-called holandric inheritance).

TABLE I. HEREDITARY CENTRAL NERVOUS SYSTEM DISEASES AND ANOMALIES IN CHILDREN

Acrocephalosyndactyly: Heredity probably of importance.
Amaurotic Idiocy, infantile (Tay-Sachs' disease): Recessive.
Anencephaly: Incidence 1/1000. Risk for CNS anomaly in later siblings 2 per cent. Risk of abortion is 20 per cent.
Ataxia, Friedreich's: Generally recessive.
Ataxia, cerebellar: Generally dominant.
Cerebral diplegia: Some cases hereditary, probably recessive.
Epilepsy: Role of heredity in dispute, though generally agreed to be of some importance. Chance for recurrence in later siblings is around 2-3 per cent.
Epiloia (Tuberose sclerosis): Irregular dominant.
Gargoylism: Generally recessive, sometimes sex-linked recessive (no corneal clouding in such cases).
Hepatolenticular degeneration (Wilson's disease): Recessive.
Hydrocephalus: Incidence 1/500. Risk for CNS anomaly in later siblings 2 per cent.
Laurence-Moon-Biedl syndrome: Recessive.
Lindau's disease (Hemangioma of cerebellum and retina): Sometimes an irregular dominant.
Microcephaly: Some cases hereditary, being recessive.
Mongolism: Role of heredity is in dispute, though probably of some importance.
Muscular atrophy, progressive infantile (Wednig-Hoffman's disease): Recessive.
Muscular atrophy, peroneal: Dominant usually, but can be recessive or sex-linked recessive.
Muscular dystrophy, facioscapulohumeral: Usually dominant.
Muscular dystrophy, childhood progressive: Usually sex-linked recessive.
Myasthenia gravis: True congenital type may be hereditary.
Myotonia congenita: Dominant.
Myotonia dystrophica: Irregular dominant.
Neurofibromatosis: Irregular dominant.
Neurofibromatosis: Irregular dominant.
Oxycephaly: Sometimes recessive, sometimes dominant.
Paramyotonia: Dominant.
Periodic paralysis: Dominant.
Phenylketonuria: Recessive.
Schilder's disease (Probably includes a variety of diseases; exact classification in dispute)
    Krabbe's disease: Recessive.
    Pelizaeus-Merzbacher disease: Recessive, usually sex-linked?
Spina bifida: Incidence 1/400. Risk for CNS anomaly in later siblings 4 per cent.
Tremor, familial: Usually dominant.
Word blindness: Probably dominant.

Not only may apparent clinical entities show different genetic patterns, but they may also be due to environmental factors. Such environmentally produced mimics are termed "phenocopies," a word coined by a geneticist working with fruit flies. Microcephaly is a good example, since it may be caused by a recessive gene, radiation during pregnancy, or by toxoplasmosis during pregnancy.

Many diseases "run in families," but show no distinct pattern of inheritance. In such cases, both heredity and environment may be involved. Even though no genetic ratios can be identified, it is possible to develop "empiric risk figures." In other words, if investigation is made of a large number of families in which there has been born a child with a particular trait, the percentage of subsequently-born affected children can be determined. If there were 300 later-born children, and if fifteen showed the trait, then the empiric risk figure would be 5 per cent (or 1-in-20), and other mothers of such children could be told that subsequent children of theirs would have a 5 per cent risk of having the trait. In such circumstances the "entity" involved may well have multiple causative factors, and the individual pedigrees must therefore be evaluated carefully.

Although the genetically determined diseases and anomalies constitute a relatively small fraction of the central nervous system difficulties of childhood, the genes themselves are not really rare. Phenylketonuria occurs but once in about 25,000 children, but approximately one in every hundred individuals is a carrier of the gene. The carrier incidence is considerably higher for the more common recessive diseases.

A tabulation (Table I) has been made of the various hereditary and familial conditions of the central nervous system which present themselves in children. Except for several specific types, mental deficiency has been omitted, since it represents a poorly understood conglomerate of conditions. Although there are undoubtedly inherited susceptibilities to infections of the central nervous system, as has been shown for poliomyelitis, this subject has been omitted because environmental factors are so predominant. Also omitted are many of the rarer conditions, such as the recently described progressive familial infantile cerebral dysfunction in which the urine is said to have the odor of maple syrup. Likewise, the psychoses have been omitted, since they should be dealt with in detail if they are to be mentioned at all.

Bibliography

Sorsby, A.: Clinical Genetics. St. Louis: C. V. Mosby Co., 1953.

(This is the best complete text, and has excellent sections on genetic theory and clinical features. Neurological diseases are dealt with in an authoritative manner.)

Baker, A. B.: Clinical Neurology, 3 volumes. New York: Hoeber, Inc., 1955.

(The last chapter in the last volume is devoted to a discussion of heredity and hereditary diseases.)

Reed, S. C.: Counseling in Medical Genetics. Philadelphia: W. B. Saunders Co., 1955.

(This is an easy to read small volume which covers all of the common hereditary diseases. It is the quickest reference for physicians to consult.)

SMOKING AND THE CARDIOVASCULAR SYSTEM

(Continued from Page 111)

used. The main stream of smoke from one cigarette of each batch contained respectively an average of 0.23, 0.55, 1.28, 1.83, 2.47 and 3 mg. of nicotine. As the concentration of nicotine in the main stream of the smoke was increased, the skin temperatures of both the fingers and toes decreased until the effects were the same as those from standard cigarettes. The lower the concentration of nicotine in the smoke the less the blood pressure and pulse rate increased from the basal level and vice versa. The increase was sharp when the concentration of nicotine was raised from 0.55 to 1.28 mg. Nicotine, then, has a most important rôle in production of the vascular changes which accompany smoking and these observations explain why the same vascular effects were obtained during the smoking of standard cigarettes and denicotinized cigarettes. Apparently, the content of nicotine in a cigarette must be decreased more than 60 per cent from that in a standard cigarette before smoking produces only slight or no vascular effects.

Since the oral administration of alcohol dilates the blood vessels of the extremities in contrast to the constriction from smoking, control smoking tests were made and on the next day the effect of smoking after the taking of alcohol was investigated. Eighty-seven smoking tests were made to determine the effect after ingestion of alcohol.† The blood pressure and pulse rate rose definitely on smoking after the ingestion of alcohol in 72 per cent of the subjects. The skin temperature of the fingers and toes decreased below the basal level on smoking after ingestion of alcohol. This seems to indicate that the alcohol did not prevent vasoconstriction from smoking.

---

†In the alcohol test 1 ounce of 95 per cent ethyl alcohol in fruit juice was administered orally and smoking was begun between thirty and sixty minutes after the ingestion at the height of the vasodilatation as measured by the increase in the skin temperature.

Editorials

John F. Briggs, M.D.
Arthur H. Wells, M.D.
Henry G. Moehring, M.D.

THE WRITTEN AND THE SPOKEN WORD

Much of the English that we hear nowadays and that we probably think of as spoken actually goes back to a written text. The President of the United States, for example, may seem to be talking informally in one of his fireside chats, but he is in fact reading from a carefully prepared manuscript. Even an interview that sounds very casual over the radio or television has probably been written out in every detail and timed to the half minute.

Thus, despite radio and television, writing is still important. Time over the air is too valuable to be subjected to the hazards of chance expression. When we wish to make sure that we have said what we wish to say as we wish to say it, we put it down in writing.

The study of writing within the framework of the communication skills has been helpful, however, in giving us a new point of view about writing and fresh approaches to it. "Good English" is no longer an arbitrary standard of formal and literary usage taught in the classroom but impractical elsewhere. It is English that is suited to a specific situation, and more often than not will be informal rather than formal.

Informal written English "lies close to current speech," to quote Porter G. Perrin, "but it is not, when written, speech exactly reproduced, partly because the written vocabulary is larger and somewhat more precise than the spoken. But its movement is largely colloquial, the movement of spoken English refined, tidied up, shorn of its looseness." This suggests that informal writing need not be regarded as such a highly specialized skill that communication between specialists and laymen must be left to the journalist as an intermediary.

Writing for others in the same professional field continues, for the most part, to be formal. The less specialized professional journals usually include both formal and informal writing.

It has been inevitable in a day of mass production that someone should have attempted to reduce the art of writing to a simple formula. The best known one is that devised by Rudolf Flesch and explained in his book *The Art of Readable Writing*. Although simple, readable writing cannot be achieved as mechanically and easily as Flesch would lead one to think, his book does give many practical, helpful suggestions about writing. Perhaps the chief value of prose engineering efforts such as Flesch's has been to encourage business and professional people to attempt to write for others outside their field. These efforts have also served to bring about a wider understanding of the relations between spoken and informal written English.

Marjorie H. Thurston, Ph.D.
University of Minnesota

GROUP THERAPY

Many recent advances in medical therapy have made headlines—polio vaccine, cardiac surgery, and similar gains. One form of therapy has crept into the armamentarium, less spectacular but of tremendous value. This is group therapy.

To some, the very name, group therapy, causes shudders; and while they feel it may not be as catastrophic as the H Bomb, the consequences could be almost as far reaching. It is realized that from time immemorial mass therapy has been a typical device of quackery, but the understanding of modern group therapy will remove any such association.

Group therapy might well be divided into those groups conducted by lay individuals and those under professional guidance with various degrees between them. Group therapy is applicable to children as well as adults.

The groups conducted by professionally trained individuals could have as their extremes on the one end, the pure analytical type, and the repressive inspirational on the other, with again, varying degrees between.

The leadership of these groups must be supplied by the individuals qualified for the specific type of group, the psychiatrist, psychoanalyst, psychologist, or physician interested in patients' problems.

There are those who feel that group therapy developed as an expedient to war-time conditions. The first authentic groups appeared in the very early part of the century, and one of the first non-psychiatric groups appeared in this country in 1905 for tuberculous patients. The application of group psychotherapy to a subject for which it would appear almost specific, mental disorders, appeared in 1911. The psychoneurotic and psychosomatic conditions offer a most fruitful field for group therapy.

Group therapy has proven its values, and a study of the results reported from both psychiatric and non-psychiatric groups should allay the fears of those who shudder.

The dangers of group therapy lie not in the well-handled, well-studied groups, but in its adoption as a "cure yourself technique" unscreened and unguided. For those whose suspicions and prejudices cannot be overcome, one wonders whether "they are not throwing the baby out with the bath water."

Harvey O. Beek, M.D.

THE INTERNSHIP AND LICENSURE

There are growing stresses in many areas involving medical education and medical services. One of the vital areas on which much attention has been focused recently is the internship. In the symposium sponsored by the Council on Medical Education and Hospitals and presented before the Congress on Medical Education and Licensure a year ago, Dr. E. M. Leveroos of the Council Staff, provocatively issued the challenge that "the internship no longer provides sufficiently advanced educational opportunities and experience to justify its continuation as a separate and distinct phase of medical education."

Because internship is a legal requirement for licensure in some states and because of the National Board's demand for an internship prior to taking Part III of its examination, it may have been expected that licensing boards would have taken strong opposition to the challenge quoted above. Despite the pressure to shorten the total period of professional study and the criticism relating to rapid rotation through various services, four of the five panelists vigorously supported the value of the internship.

It is significant that those who supported the internship centered their defense around one major concept—that there must be a period following graduation from a medical school when the physician gradually assumes personal responsibility for definitive diagnosis and treatment. Dean Mitchell, in his discussion, referred to the internship as "a step that must be taken." The symposium, as published in the July 30, 1955, issue of *The Journal of the American Medical Association* clearly indicates the attitude of medical educators, specialty boards, and a representative cross section of the profession, the general practitioners.

There can be little doubt that, for purposes of providing time for assuming responsibility, the internship, through the years, has actually become an essential part of the total picture of medical education. The licensing boards have an interest in the internship because the true purpose of the licensing examination is essentially more practical than educational, and it attempts to cover the major branches of medical practice. Certainly, one of the major objectives of all education is to develop responsibility in the individual and, on this premise, educational effort must extend into the postgraduate area. Some of the present unrest in various state boards may represent a more critical interest in the appraisal of responsibility in the physician.

For the intern, the internship has two definite implications. First, as an essential "step," it should be considered an educational effort with a special purpose. Secondly, the intern should anticipate that his licensure examination will be largely a test of his fifth year in medical education.

The opinions expressed in the symposium are representative enough to illustrate that the internship is a vital link in the chain of events leading to the making of a competent physician. It may well serve, also, as a reflection of joint responsibility in the total field of medical education. The most important challenge involving internships is that they be improved.

S. D. Ezell, M.D.

RESEARCH AND THE PRACTICING PHYSICIAN

No one should appreciate the importance of research better than the practicing physician. Research provides the weapons and the ammunition with which he combats disease. He is peculiarly qualified to understand research. He has been initiated into its mysteries. He has trod the academic halls, been exposed to the laboratory, and learned the basic principles of science. He is familiar with the vocabulary of science and can understand the purpose of research even when at times unable to follow its intricacies.

Research, simply stated, is man's search after nature's truths, insofar as he is able to discover them. *Basic research* seeks to increase our understanding of natural phenomena without promise of practical application. *Applied research* exploits discoveries for practical ends. The former is the bedrock of scientific advance, but may be pedantic and sterile without the latter. Applied research is empirical and often falacious without a foundation in basic research.

We live in an age of science. Our highly technological society is increasingly dependent upon the fruits of research—the discovery of fundamental principles and their application to practical problems. This dependence is reflected in the phenomenal growth of research. The growth curve clearly indicates the need for progressively expanded research efforts in the future.

The essentials for a productive research program are: adequate facilities and equipment, a suitable intellectual environment; adequate means of communication; and properly trained and highly motivated *brainpower.* Only one of these prerequisites, facilities and equipment, can be bought outright. The others require something more: insight and sympathetic understanding of research and those who follow a research career.

Winston Churchill is quoted as saying that science is no more than organized curiosity. Certainly, curiosity is a principal motivating force for those who choose a research career. All of us are curious in childhood as any parent can testify, but few of us retain this curiosity (or, at least, the initiative to satisfy it) as we grow older. Perhaps we tire of the effort, perhaps we are too busy making a living, perhaps we surrender in despair—there are so many things to know and to understand. But there are some who retain this childhood curiosity and are impelled to satisfy it; to them, the most important thing in life is the discovery of nature's secrets. These are the men and women we need in research. Every such individual who is diverted to another occupation is lost to science.

Essential for productive research is a favorable intellectual environment in which the investigator may work with a minimum of distraction. The atmosphere must be sympathetic to his needs. There must be opportunity for association with other investigators. The academic soil, with its opportunities for cross-fertilization, approaches the ideal.

Adequate means of communication is more than a local problem. The individual in research must be able to compare notes with his peers, to exchange experiences and ideas, to give and take in the friendly rivalry of comment and criticism. This is the life blood of research. Textbooks, monographs and scientific journals are helpful, scientific meetings more so, but intimate personal contact is most rewarding.

Finally, there is the matter of dollars and cents. Both facilities and equipment are increasingly complex and costs mount accordingly. The economic security of the investigator is a problem and more and more men are lost to research because of economic pressures. Total funds in support of research increase, but not in proportion to the need. If we must have the results of research, we must pay the price.

Cardiovascular research, with which this writer is most familiar, is an important facet of medical research. As such, it is governed by the broad principles of biological research, and has similar needs. Its achievements are no less than those of other medical researches, although they are sometimes overshadowed by the complex problems which remain.

One tremendous recent development is cardiovascular surgery. It becomes difficult to recall the days prior to the discovery of modern surgical techniques and ancillary developments. Mechanical hearts, hypothermia, improved anesthesia, cardiac catheterization and angiocardiography, and current methods for treating cardiac emergencies originated in the research laboratory.

Epidemiological research showed that rheumatic fever follows the ubiquitous streptococcal infection. Laboratory and clinical research established the usefulness of sulphonamides and antibiotics. It then became possible for the practicing physician to prevent rheumatic fever and rheumatic heart disease. One may now confidently predict that one day rheumatic fever will be eradicated.

Not long ago, the accepted treatment for most cases of hypertension was sedation and speculative advice. Then, briefly, surgery was the answer. Now we have a spectrum of helpful drugs, none of which is perfect, but which in the aggregate are encouraging. The point is that there have been developments and advances. We look to research to find the cause of essential hypertension if we are to cure it.

Arteriosclerosis, specifically atherosclerosis, is the public enemy number one with which medicine has yet to deal effectively. We do not know its cause, empiricals have failed, and consequently, we can neither prevent nor cure it. Meanwhile, the study of this disease has mushroomed. Who can doubt the ultimate success of research here also?

Research's greatest need is for trained young people strongly motivated by curiosity. We must interest our youth in research, provide them with the opportunity to gain research experience and then help them become established in research careers. The practicing physician should be the most enthusiastic proponent of such a program. It is he who depends upon the weapons and the ammunition which research forges. It is he, also, who phrases many of the complex questions which stimulate the curiosity of the research scientist.

Charles D. Marple, M.D.
Medical Director
The American Heart Association

MEDICAL ETHICS IN ROUTINE PRACTICE

Each of our numerous medical societies has a committee called The Board of Censors. This is likely to be made up of men with vivid memories of their undergraduate and intern trials and financial tribulations. They are likely to assume that graduation from Class-A schools and fair internship ratings should be enough to exclude potential free-booters. This does not always work out ideally, but, for the most part, boards of censors have less to do with the qualifications of recent graduates than those members who are apt to travel from state to state and often represent interrupted and broken lives.

Recently, a well-domesticated elephant from a circus somewhere in the East decided to go on her own. Great disaster to the surrounding area and grief to the circus have followed up to date. Sharp hooks snagged into the animal's ears by exasperated keepers have not brought her back to the bosom of her feeding lot. A keeper in whom she has the utmost confidence is said to be the only hope for saving this worthy animal.

Perhaps this is not a dignified way to outline the work of a good board of censors or point the way as to how physicians may serve in a long medical life without being censored. It does focus attention, however, on three major premises: that an accredited graduate and licensed physician has been taught and guided by an ethically minded faculty; that the group, or medical society he wishes to join condones none of the evil practices that demean the guild as a whole; that the individual sets himself, without coercion, to fit into the field of honest medical practice and, as easily, gives example of normalcy as does the devoted husband in his conjugal relationships.

This is asking a good deal, but in a field as complicated as ours, it is noteworthy how few men deviate from normal standards despite the obvious fact that a few, through alcohol, drugs, or bad association, yield to the urge to defy our Hippocratic rules and allegiances.

Edward L. Tuohy, M.D.

INCOME MANAGEMENT

Family Service of Saint Paul has developed resources within its framework to assist families. These resources include Income Management, Homemaker Service and Temporary Child Placement.

For income management, families are referred to the agency primarily by employers or creditors when the families are not able to pay their bills and their wages have either been garnisheed or are threatened by garnishment. The service given in these situations for the most part is educational; however, some of these families need, and learn that they must have, help with their personal and/or marital problems before they can handle their indebtedness.

The request for this service is great. In 1954, more than $205,700.00 of families' own funds were handled through Family Service. The funds are disbursed in the following manner. With guides made available through the consulting home economist, a budget is made for the family. This is a low-cost budget which allows minimal

---

This is sixth in a series on Family Service of Saint Paul—a Community Chest Agency. Family Service of Saint Paul has developed resources within its framework to assist families. These resources include Income Management, Homemaker Service and Temporary Child Placement.

essentials for the family. This amount is subtracted from the total income, and the balance is prorated among the creditors.

Often, Family Service must start by taking a wage assignment to prevent pressure from any one creditor's throwing the prorate out of balance. The family's earnings are mailed to Family Service by the employer. The amount previously decided upon jointly with the family for living expenses is returned to the family and the remainder is mailed to the creditors on a pro rata basis.

One question often asked is: What do these people buy that gets them into debt? At first glance, one is likely to think that the purchase of automobiles and television sets is the primary cause. It is true that the purchase of a used automobile that soon won't run without a great deal of repair and has to be turned in on another puts the debtor in the position of paying for two automobiles instead of one. However, most of these families who own automobiles need them in their work to provide transportation to and from work because public transportation is not available.

More than half of all indebtedness is for essentials, including doctor and hospital bills. Pressure put on by hospital management to pay the bill in full before the patient leaves the hospital drives families to small loan companies. This places an increased burden on the debtor because he pays 3 per cent per month on the loan. Oftentimes, on a prorate basis, the debtor is able to pay only the interest.

Family Service has facilities in casework staff and bookkeeping to handle approximately 120 families for money management at one time. Therefore, the number accepted for this service must be limited. Families with children are given priority, and those families whose income or situation is such that the job is in jeopardy if they do not receive help are accepted. In other words, Family Service concentrates on the "hardship" cases.

Families eligible for this service from Family Service of Saint Paul must live in Ramsey County or West Saint Paul, or the wage earner must be employed in a company that contributes to the Greater Saint Paul Community Chest and Council.

(Mrs.) Lois Hoffman
Director of Case Work Services

BANKS AND INVESTMENT SERVICES

Few people realize how many services are available in a bank's investment department in addition to the basic functions of a bank, such as accepting deposits for checking or savings accounts and lending money for various purposes. If one wants a plan for the building of an estate or permanent investment of an estate, there is no better place than a bank to consult representatives with long experience. This is true primarily in the larger banks or their affiliates. Whether the account is large or small, the knowledge and research facilities are invaluable in setting up lifetime plans with periodic servicing of accounts.

Is your income burdened with heavy taxes requiring tax exemption, or do you want more income to supplement earnings from your practice? These questions are normal, day-to-day problems in a bank investment department.

Do you want a balanced investment program with growth possibilities but with a certain amount of risk, or do you want assured income? This can be worked out to the individual's needs. If your present investments require a going-over to weed out the weaker securities to improve general quality, this can be done.

If you want principal maturing for education or other purposes, a bank can supply these needs. Or, if you just want to sell or buy, no place is more logical than a bank.

If you want to safely ship securities under a blanket insurance policy to practically any place in the country with a post office address (preferably to a bank), it can easily be done through a bank's investment department.

Bonds and stocks called for redemption or to be sent in for conversion are handled by trained employees with the "know-how" in expediting these functions.

Call features can be checked, dividends claimed, and transfers made with proper taxes determined. Liquidation of estates with security holdings are routine for the staff in a bank.

Many bank research departments have extensive files and available data covering government, municipal, industrial, public utility, railroad, and other types of securities. The need for providing pertinent and thorough information for the administration of trusts in a bank or trust company affiliate make available data which would be difficult to obtain from other sources.

A bank also acts for the United States Government in the distribution and collection of all kinds of Federal obligations. Questions regarding reissuance and changes can be answered readily in a bank.

Bernard B. Knopp
Manager, Municipal Bond Department
The First National Bank of Saint Paul

SICK LEAVE AND THE TAXPAYER

Periodically, we all need a stimulus to start us thinking—particularly along specific lines. Periodically, we all might do well to review our actions with an eye toward whether we want to maintain a reasonable standard of honesty, or whether we should be good fellows. Specifically, we are leading up to the matter of a physician's certification of the need for sick leave for a Civil Service employe, though the same principles will hold for any employe.

The whole matter is best expressed in a letter to the Secretary of the Massachusetts Medical Society from the Commander of the Boston Naval Shipyard, published in the December 8, 1955, issue of *The New England Journal of Medicine*. In it, the commander points out that: (1) a sick leave application is a legal document which forms the basis for the payment of government funds; (2) each day of unnecessary and unwarranted absence contributed to excessive costs and delays; and (3) unwarranted sick benefit payment, or padded or exaggerated vouchers, add to the tax burden of all citizens, and, in addition, constitute an element of fraud.

What with all our real concern about excessive governmental expenditures, we can afford to take a realistic attitude toward sick-leave certifications and sign them only when sickness or injury physically incapacitates the employe, when the sick leave is necessary for his health.

H.G.M.

NEW LOOK

Attention of our readers is called to the use of a different type face in Minnesota Medicine, Baskerville, which is considered a more readable type than that used in the past. Another change, instituted with the publication of the January, 1956, number, is wider spacing between columns of type on each page, giving a better separation between the two columns. This also was done in the interest of easier reading.

From time to time, other changes in the format will be made with the object of improving the journal both in attractiveness and readability.

THE SYSTEMIC MYCOSES

(Continued from Page 110)

4. Schoenbach, E. B., Miller, J. M., and Long, P. H.: The treatment of systemic blastomycosis with stilbamidine. Ann. Int. Med., 37:31-47 (July) 1952.
5. Chavarría, A. P., Bonilla, M. A., Díaz, M. F., and Jenkins, A. C.: Apuntes sobre un nuevo caso de granuloma paracoccidioides en Costa Rico. Rev. méd. Costa Rico, 16:369-375 (Mar.) 1949.
6. Perry, H. O., Weed, L. A., and Kierland, R. R.: South American blastomycosis: report of case and review of laboratory features. A.M.A. Arch. Dermat. & Syph., 70:477-482 (Oct.) 1954.
7. Conan, N. J., Jr., and Hyman, G. A.: Disseminated coccidioidomycosis treated with protoanemonin. Am. J. Med., 9:408-413 (Sept.) 1950.
8. Wier, R. H., Egeberg, R. O., Lack, A. R., and Leiby, G. M.: A clinical trial of prodigiosin in disseminated coccidioidomycosis. Am. J. M. Sc., 224:70-76 (July) 1952.
9. Lamb, J. H., Rebell, Gerbert, Jones, P. E., Morgan, R. J., and Knox, J. M.: Combined therapy in histoplasmosis and coccidioidomycosis: methyltestosterone and meth-dia-mer-sulfonamides. A.M.A. Arch. Dermat. & Syph., 70:695-712 (Dec.) 1954.
10. Waksman, S. A., Schatz, Albert, and Reilly, H. C.: Metabolism and chemical nature of streptomyces griseus. J. Bact., 51:753-759 (June) 1946.
11. Wilson, H. M., and Duryea, A. W.: Cryptococcus meningitis (Torulosis) treated with a new antibiotic, actidione. A.M.A. Arch. Neurol. & Psychiat., 66:470-480 (Oct.) 1951.
12. Kuhn, L. R.: Effect of elevated body temperatures on cryptococcosis in mice. Proc. Soc. Exper. Biol. & Med., 71:341-343 (July) 1949.
13. Christie, Amos, Middleton, J. G., Peterson, J. C., and McVickar, D. L.: Treatment of disseminated histoplasmosis with ethyl vanillate. Pediatrics, 7:7-18 (Jan.) 1951.
14. Michael, Max, Jr., and Vogel, R. A.: Histoplasmosis: report of a case, with observations on management. New England J. Med., 251:884-887 (Nov. 25) 1954.
15. Geraci, J. E., Ulrich, J. A., Dry, T. J., Weed, L. A., Sayre, G. P., and MacCarty, C. S.: 2-Hydroxystilbamidine in the therapy of sporotrichosis. J. Lab. & Clin. Med., 44:800 (Nov.) 1954.

EOSINOPHILIA IN MALIGNANT DISEASE

(Continued from Page 102)

of interest were the occurrence of a leukemoid blood picture and the unusual clinical manifestation of segmental superficial thrombophlebitis.

References

1. Isaacson, N. H., and Rapoport, Paul: Eosinophilia in malignant tumors: its significance. Ann. Int. Med., 25:893-902 (Dec.) 1946.
2. Stickney, J. M., and Heck, F. J.: The clinical occurrence of eosinophilia. M. Clin. North America, pp. 915-919 (July) 1944.
3. Grewe, H. E., and Schlitter, H. E.: Beitrag zur Frage der Bluteosinophilie bei malignen Tumoren. Klin. Wchnschr., 32:118-119 (Feb. 1) 1954.

President's Letter

GROUP LIABILITY INSURANCE

The marked increase in malpractice insurance rates in 1952, and again in 1954, resulted in our Council's appointing a special committee to survey the entire field of malpractice insurance. On recommendation of this committee, the House of Delegates in May, 1955, voted to sponsor a group plan of liability insurance for Minnesota doctors, underwritten by the St. Paul-Mercury Indemnity Company.

At the same meeting, the Association also sponsored a group disability insurance program, and, though I believe both plans were explained to most of the component medical societies by our Mr. Harold Brunn, the group disability was pressed because it was necessary to have 50 per cent participation by a certain deadline to put the plan into effect. From numerous inquiries received, I feel some confusion exists and many doctors have forgotten the advantages of the group malpractice plan.

The advantages pointed out by the committee are, briefly: that increased volume of business by an experienced company will permit increased specialization of investigative personnel, defense attorneys, et cetera, needed for the peculiar problems involved in malpractice insurance; insurance will be available to members in good standing without the compulsion of buying other types of insurance to get it; an extensive and co-ordinated educational program of prophylaxis and control will be implemented; vigorous defense against all non-meritorious claims will be stressed with the purpose of eliminating the so-called "nuisance-claim settlements" which only lead to more future unwarranted claims.

The final and most important advantage is that it will afford close liaison between the insurance company and our Association in all matters, including selectivity of risks with possible exclusion of chronic offenders, furnishing of expert testimony in defense of these cases, and medical judgment as to whether a case should be defended in court or settled out of court. This same liaison will provide statistical facts and figures on which future rates will be based. This close liaison between the underwriters and the Association, in my mind, is the greatest advantage. Our Association has an exceptionally capable Medical Advisory Committee that has always been willing and anxious to serve any member threatened with a malpractice action, but they have too rarely had the opportunity. Under this plan, they will be in close consultation with the insurance company on all threatened actions and their knowledge, judgment, and experience will be invaluable.

The rates on the group plan will run about 5½ per cent lower than present standard rates. The more doctors joining the group, the greater will be the opportunity for more efficient and economic handling of cases. More important, a future reduction will be possible in the number of cases. and a corresponding probable reduction in rates.

This does not in any way involve any discrimination or condemnation of other plans or companies. It is simply that we believe that the plan and the company selected most suitably meet the needs of the Association at this time.

As our present liability contracts expire, I feel, in justice to each other and for the good of all, we should very seriously consider our Association Group Liability Insurance Plan.

R. H. Wilson

President, Minnesota State Medical Association

Medical Economics

Edited by the
Committee on Medical Economics,
Minnesota State Medical Association
George Earl, M.D., Chairman

STATE OF THE UNION MESSAGE

The following comments do not indicate the official position of the American Medical Association on specific items of legislation proposed in President Eisenhower's third message on the State of the Union. Such measures may be commented upon intelligently only after examination of the specific bill. The quoted paragraphs are from the message; they are followed by a brief summary of the past position of the AMA on previous measures in the same area and are furnished for background information only.

"In the last analysis, our real strength lies in the caliber of the men and women in our armed forces, active and reserve. Much has been done to attract and hold capable military personnel, but more needs to be done. This year, I renew my request of last year for legislation to provide proper medical care for military dependents and a more equitable survivors' benefit program. The administration will prepare additional recommendations designed to achieve the same objectives, including career incentives for medical and dental officers and nurses, and increases in the proportion of regular officers."

The AMA believes that dependent medical care, if authorized by Congress, should primarily utilize civilian facilities and civilian physicians, with care to be furnished in military hospitals or by physicians in uniform only in overseas areas or where civilian resources are inadequate.

The AMA vigorously supports a career incentive program adequate to attract a sufficient number of physicians and dentists to voluntary service. Only in this manner can the necessity for some form of involuntary service be reduced.

"Closely related to the mission of the defense department is the task of the federal civil defense administration. We must strengthen federal assistance to the states and cities in devising the most effective common defense."

The AMA urges greater emphasis on the medical aspects of civil defense, with adequate appropriations to permit a realistic preparation for medical emergency produced by atomic, chemical or biological attack.

"Under the 1954 amendments to the old-age and survivors' insurance program, protection was extended to some 10 million additional workers and benefits were increased. The system now helps protect nine out of ten American workers and their families against loss of income in old age or on the death of the breadwinner. The system is sound. It must be kept so. In developing improvements in the system, we must give the most careful consideration to population and social trends, and to fiscal requirements. With these considerations in mind, the administration will present its recommendations for further expansion of coverage and other steps which can be taken wisely at this time."

The AMA urges a thorough, objective and impartial study of the economic, social and political impact of Social Security, both medical and otherwise, as the sole basis for objective non-political improvements in the Act. The AMA opposes the compulsory coverage of physicians under OASI, but does not oppose their inclusion on a voluntary basis similar to that permitted ministers.

"Other needs in the area of social welfare include increased child welfare services, extension of the program of aid to dependent children."

This is a part of the Social Security Act, a thorough study of which is urged as the sole basis for any further changes.

"The nation has made dramatic progress in conquering disease—progress of profound human significance which can be greatly accelerated by an intensified effort in medical research. A well-supported, well-balanced program of research, including basic research, can open new frontiers of knowledge, prevent and relieve suffering, and prolong life. Accordingly I shall recommend a substantial increase in federal funds for the support of such a program. As an integral part of this effort, I shall recommend a new plan to aid construction of nonfederal medical research and teaching facilities and to help provide more adequate support for the training of medical research man power."

The AMA has, in the past, been a supporter of properly administered research grants and supports one-time "brick and mortar" construction grants, on a matching basis, for medical schools. The AMA has opposed "research construction" grants unco-ordinated with other federal research or construction programs. The AMA also opposes federal subsidies to educational facilities, when used for operation or maintenance, because of the virtual certainty of federal control of the institution.

> "Finally, we must aid in cushioning the heavy and rising costs of illness and hospitalization to individuals and families. Provision should be made, by federal reinsurance or otherwise, to foster extension of voluntary health insurance coverage to many more persons, especially older persons and those in rural areas. Plans should be evolved to improve protection against the costs of prolonged or severe illness. These measures will help reduce the dollar barrier between many Americans and the benefits of modern medical care."

The AMA supports voluntary health insurance plans and is convinced that their rapid growth and expansion is proof of their ability to cover all risks which can be covered under an insurance principle. Federal reinsurance is opposed as unnecessary, unworkable except as a subsidy, and dangerous to the orderly development of sound voluntary health insurance programs.

> "Other legislation will be proposed, including legislation for prepaid group health insurance for employes and their dependents."

The AMA supports the principle of contributory health insurance, on a voluntary basis, for federal employes.

> "All of us share a continuing concern for those who have served this nation in the armed forces. The commission on veterans pensions is at this time conducting a study of the entire field of veterans' benefits and will soon submit proposed improvements."

The AMA urges the provision of the finest medical care possible to veterans with service-connected illness or disability, but opposes federal medical care for illness or disability unrelated to military service.

COST OF PROPOSED MEDICAL RESEARCH

The Department of Health, Education and Welfare will be able to present good arguments for increasing its $99 million medical research allowance by another $25 million. Also, the heady prospect of balancing the budget seems to have given administrators a happy feeling of, "After all, we can afford it."

Many departments of the government share this expansive attitude, but, it must be mentioned, the budget has not yet actually been balanced. Even if the increased revenues that are resulting from the current boom manage to balance the budget this fiscal year, there is nothing to guarantee these revenues will stay at a high level. And if they do not, will the same administrators who are asking for part of the increased revenue, volunteer to take a cut in appropriations? In Washington, it doesn't seem likely.

Health, Education and Welfare Secretary Folsom was asked whether his proposed new spending would fit into the balanced budget the Administration says it is trying to achieve. Yes, he said, if the present revenues continue. This, in spite of the fact that it costs $60 billion every year to run a government that is more than $280 billion in debt.

It is at least questionable whether a government that habitually spends more than it makes until it finally owes more than four times its current income, can "afford" new luxuries.

CANCER RESEARCH MAY BENEFIT

According to "Washington Report on the Medical Sciences," principal beneficiaries of new appropriations for medical research will be cancer, mental and heart research. These funds will be allocated through the National Institutes of Health, the Public Health Service research arm.

For the National Cancer Institute, the White House will ask Congress to approve $32,437,000; for the National Heart Institute, $22,106,000; for the National Institute of Mental Health, $21,749,000. Four other institutes that will share to a lesser extent are those for Dental Research, Arthritis and Metabolic Diseases, Microbiological and Neurological Diseases and Blindness.

The National Institutes of Health budget for operating expenses was doubled. This item covers basic research in several fields and research fellowships. Indications are that Secretary Folsom favors more emphasis on fellowship awards in addition to increases in basic research.

MILITARY DEPENDENTS' HEALTH INSURANCE

One of the first bills to reach the hoppers for the medical care of military dependents was introduced in the House of Representatives by Chairman Carl Vinson (Democrat, Georgia) of the House Armed Services Committee. Under

(Continued on Page A-38)

Reports and Announcements

MEDICAL MEETINGS

State

Minnesota State Medical Association, annual meeting, Mayo Civic Auditorium, Rochester, May 21-23, 1956.

National

American Goiter Association, Drake Hotel, Chicago, Illinois, May 3-5. Secretary, Dr. John C. McClintock, 149½ Washington Ave., Albany, New York.

American Association of Blood Banks, ninth annual meeting, Somerset Hotel, Boston, Massachusetts, September 3-5. Secretary, Marjorie Saunders, 725 Doctors Building, 3707 Gaston Ave., Dallas, Texas.

Chicago Medical Society, annual clinical conference, Palmer House, Chicago, February 28-March 1, 1956.

Mediclinics of Minnesota, postgraduate course sponsored by Academy of General Practice of Broward County, Fort Lauderdale, Florida. March 5-14, 1956.

International Meetings

Canadian Medical Association, Quebec, Canada, June 10-14. Secretary, Dr. Arthur D. Kelly, 150 St. George St., Toronto, Ontario, Canada.

Congress of International Anesthesia Research Society, Miami Beach, Florida, April 9-12. Write Dr. R. J. Whitacre, 13951 Terrace Road, Cleveland, Ohio.

Congress of International Society of Hematology, Hotel Somerset, Boston, Massachusetts, August 27 to September 1. Secretary, Dr. W. C. Maloney, 39 Bay State Road, Boston, Massachusetts.

Inter-American Congress of Cardiology, Havana, Cuba, November 4-10. Write Dr. Ramon Aixala, Apartado 2108, Havana, Cuba.

International Academy of Pathology, Cincinnati, Ohio, April 24 and 25. Secretary, Dr. F. K. Mostofi, Armed Forces Institute of Pathology, Washington 25, D. C.

International Congress of International College of Surgeons, Palmer House, Chicago, Illinois, September 9-13. Secretary, Dr. Max Thorek, 1516 Lake Shore Drive, Chicago, Illinois.

World Medical Association, Havana, Cuba, October 9-15. Secretary, Dr. Louis H. Bauer, 345 E. 46th St., New York 17, New York.

Tenth Inter-American Congress of the Pan American Medical Association, Mexico City, Mexico, April 15-21, 1957. Executive director, Dr. Joseph J. Eller, 745 Fifth Avenue, New York, New York.

BIBLIOGRAPHY OF MEDICAL REVIEWS

The Armed Forces Medical Library announces the publication in May of a *Bibliography of Medical Reviews.*

The bibliography, arranged by subject,, will contain approximately 800 references to review articles in clinical and experimental medicine and allied fields which have appeared in the calendar year 1955.

Copies of the *Bibliography of Medical Reviews* will be available upon request to the Director, Armed Forces Medical Library, 7th Street and Independence Avenue, Southwest, Washington 25, D. C., in the order of receipt.

MINNESOTA SOCIETY OF NEUROLOGY AND PSYCHIATRY

"Psychiatric Aspects of Dysmenorrhea" will be the subject presented by Irving C. Bernstein, M.D., and John L. McKelvey, M.D., of Minneapolis at the regular meeting of the Minnesota Society of Neurology and Psychiatry at the Town and Country Club. Saint Paul, Tuesday evening, March 13, 1956.

FIRST INTERNATIONAL CONGRESS OF HUMAN GENETICS

The first International Congress of Human Genetics will be held in Copenhagen, Denmark, August 1-6, 1956. This congress is planned to cover all genetic aspects of normal and pathological characteristics in man. Any person interested in the subject of human genetics and especially of medical genetics is invited to take part in the congress.

Provisional program and further information will be sent on request. Write the Secretariat of the First International Congress of Human Genetics, University Institute for Human Genetics, 14 Tagensvej, Copenhagen, N., Denmark.

PROGRAM OF SURGERY FOR CONGENITAL CARDIAC MALFORMATIONS

A regional program of surgery for congenital cardiac malformations has been developed for out-of-state children through the joint efforts of the Children's Bureau of the United States Department of Health, Education, and Welfare and the Minnesota Crippled Children Services. The University of Minnesota Hospitals has been designated as the regional center for this surgery. A similar program for Minnesota children has been established by Minnesota Crippled Children Services, in collaboration with the regional program. In order to facilitate offering the services to Minnesota children, the University of Minnesota Hospitals will be used, for the present; however, plans are being made to include other Minnesota hospitals as participants in the program, provided that the hospitals are interested and have facilities available for this specialized service.

A detailed announcement is being forwarded to all the physicians, public health nurses, and county welfare agencies in the state. Inquiries about the program should be directed to Crippled Children Services, Medical Services Division, Department of Public Welfare, 117 University Avenue, Saint Paul 1, Minnesota.

CONTINUATION COURSES

The University of Minnesota announces a continuation course in *Endocrinology for General Physicians* which will be held at the Center for Continuation Study from April 9 to 11. Management of the more common endocrine and metabolic abnormalities will be stressed. Guest speaker will be Dr. Peter H. Forsham, associate professor of medicine and pediatrics, University of California Medical School, San Francisco. The course will be presented under the direction of Dr. C. J. Watson, professor and head, Department of Medicine.

* * *

A continuation course in *Gynecology for Specialists* will be presented by the University of Minnesota next April 12 to 14 at the Center for Continuation Study. The course will be presented under the direction of Dr. John L. McKelvey, professor and head, Department of Obstetrics and Gynecology.

* * *

Radiology for General Physicians will be the subject of a continuation course to be presented April 16 to 18 by the University of Minnesota at the Center for Continuation Study. Registrants will have an opportunity to interpret films and carry out certain techniques under the supervision of qualified instructors. Attendance will be strictly limited, and early application is essential.

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

230 Lowry Medical Arts Building
Saint Paul 2, Minnesota

F. H. Magney, M.D., Secretary

MINNEAPOLIS WOMAN SENTENCED ON ABORTION CHARGE

Re: State of Minnesota vs. Helen Hicks, also known as Helene Reznick, Mrs. Roberts and Mrs. Raynick.

On January 9, 1956, the above named defendant, twenty-two, formerly Helen Hicks of 3428 Columbus Avenue, Minneapolis, was sentenced by the Hon. Levi M. Hall, Judge of the District Court of Hennepin County, to a term of not less than one year nor more than four years in the State Reformatory for Women at Shakopee, Minnesota, on a charge of "pregnant woman attempting abortion." However, Judge Hall suspended the sentence and placed the defendant on probation for a period of two years. The defendant stated to the Court that she married Morris Reznick of Minneapolis in December, 1955. When questioned by Judge Hall, she admitted that she had performed an abortion on herself on or about June 15, 1954.

As the result of an investigation conducted in June, 1955, by officers of the Minneapolis Police Department and a representative of the Minnesota State Board of Medical Examiners, the abortion charge was lodged against the defendant and a warrant was issued for her arrest but the authorities were unable to locate her until November, 1955, when she was arrested in Chicago, Illinois. After being returned to Minneapolis, the defendant entered a plea of guilty to the charge against her before Judge Hall on November 12, 1955.

WOMAN'S AUXILIARY

RAMSEY COUNTY NEWS

Mrs. L. G. Culver

The Ramsey County Medical Auxiliary board members started the new year with a record attendance of twenty-seven present at the January board meeting. Reports given by the committee chairmen showed that the doctors' wives have not been idle the past month.

Mrs. H. F. Schroeckenstein, chairman of the Medical and Surgical Relief Committee, reported that twenty-five cartons of supplies were packaged and sent to the Maryknoll Missions and twenty cartons sent to the Episcopal Diocese.

Mrs. Ralph Olson, in charge of cancer dressings, and her committee have developed a very efficient "assembly line" in making the dressings. While the board members are attending their meeting, the committee is busy cutting and folding pads in an adjoining room. These dressings are then ready for the board members to stitch while the meeting is in session. Not only has this method proved profitable, but it is also a pleasant way to get acquainted. Many members stay after the meeting to have sandwiches and coffee and continue working in the afternoon.

A very happy and successful New Year to you all.

WHY NOT PACK THE POSTPARTUM UTERUS?

(Continued from Page 90)

From our experience, we believe that rather than say, "I have never packed a uterus," it would be better to say, "No uterus has been removed because it was not packed."

Conclusion

A series of 38,403 consecutive deliveries is presented in which 505 uteri were packed because of postpartum hemorrhage due to atony. No hysterectomy was necessary in the 505 packed cases. There was no mortality due to atonic hemorrhage in this series. Our concept of the physiology of postpartum atony is outlined in support of the use of the intrauterine pack.

References

1. Eastman, N. J.: Williams' Obstetrics. P. 329. New York: Appleton-Century-Crofts, Inc., 1950.
2. Reynolds, S. M. R., Harris, J., Kaiser, I. H.: Clinical Measurement of Uterine Forces in Pregnancy and Labor. Pages 54 and 142. Springfield, Illinois: Charles C Thomas, 1954.

In Memoriam

RICHARD CHARLES ADAMS

Dr. Richard Charles Adams, a member of the staff of the Mayo Clinic since 1937, died in Worrall Hospital in Rochester, Minnesota, on January 21, 1956. His sudden death was occasioned by a heart attack. He was forty-nine years old.

Dr. Adams was born on August 7, 1906, in Woolner, Ontario, Canada. He attended Queen's University in Kingston, Ontario, from which he received the degrees of Doctor of Medicine and Master in Surgery in 1931. From August, 1931, to January, 1932, he was an intern in the Ottawa General Hospital, Ottawa, Ontario. He then became associated in the practice of general surgery with Dr. J. J. Robertson, of Belleville, Ontario.

Dr. Adams came to Rochester, Minnesota, on October 1, 1935, as a fellow in anesthesiology in the Mayo Foundation, with the accompanying rank of first assistant in anesthesiology. On January 1, 1937, he was appointed to the staff of the Mayo Clinic as a consultant in the Section of Anesthesiology. In 1940, he received the degree of Master of Science in anesthesiology from the University of Minnesota, and in the same year he was appointed an instructor in anesthesiology in the Mayo Foundation, Graduate School, University of Minnesota. He was promoted to assistant professor in 1945, and to associate professor in 1948. From April 1, 1952, to July 1, 1953, Dr. Adams was head of the Section of Anesthesiology at the Mayo Clinic.

When he became a fellow of the Mayo Clinic, Dr. Adams interested himself in the technique of producing anesthesia by the injection of anesthetic agents into veins, a technique known as "intravenous anesthesia." He became widely known for his proficiency in this particular field, and he later carried out investigations on curare.

In 1944, Dr. Adams' book, "Intravenous Anesthesia," was published, and is regarded as an exhaustive work on the subject.

Dr. Adams was certified in 1939 as a specialist in anesthesiology by the American Board of Anesthesiology, Inc. He was a member of the Minnesota State Medical Association, the American Medical Association, the American Society for Pharmacology and Experimental Therapeutics, the Alumni Association of the Mayo Foundation, and the Society of the Sigma Xi. He was a fellow of the American Society of Anesthetists, and served as a member of the board of directors of that organization from 1945 to 1947, and as a member of the House of Delegates in 1948.

Dr. Adams was married to Miss Elma M. Finkle on May 11, 1935. Mrs. Adams and two sons, Richard, eighteen, and Robert, fourteen, survive Dr. Adams.

STEPHEN HENRY BAXTER

Dr. Stephen H. Baxter, seventy-seven, former president of the Hennepin County Medical Society, died December 7, 1955, in Minneapolis. In 1943, Dr. Baxter was president of the Minnesota State Medical Association. He was a member of the "Fifty Club" and had been a life member since 1947.

Dr. Baxter was former director of the Franklin Hospital and senior surgeon at Abbott Hospital for many years. He served on the Board of Public Welfare in Minneapolis and was a past president of the Hennepin County Tuberculosis Association. He was also a member of the board of the Elizabeth Kenny Foundation.

Born in Mechanicsville, Ohio, Dr. Baxter received his medical education at the University of Minnesota. During World War I, he served with the American Expeditionary Forces as a major in the medical corps.

He was a member of Plymouth Congregational Church, the American College of Surgeons, the Minneapolis Surgical Society, and Nu Sigma Nu fraternity.

Dr. Baxter was the nephew of Dr. J. Warren Little who was president of the State Medical Association in 1916.

He is survived by his wife; a son, Stephen H., Jr., Minneapolis; a daughter, Mrs. Benjamin Thurston, Albuquerque, N. M., and a brother, John, Minneapolis.

ROLV SIGVARD HEGGE

Dr. Rolv S. Hegge, physician and surgeon of Austin, died December 17, 1955, after an illness of several years. He was a past president of the Mower County Medical Society.

Born in Austin in 1902, Dr. Hegge attended Austin High School, St. Olaf College, and the medical school of the University of Minnesota. In 1929, he returned to Austin and entered practice with his father, Dr. O. H. Hegge.

Dr. Hegge was Mower County Health Officer for nine years. He was a member of the Westminster Presbyterian Church. He was affiliated with Masonic organizations and a member of the Austin Shrine Club. He was a member of the Minnesota State Medical Association and the American Medical Association.

His survivors include his wife; three daughters, Mrs. Robert Weik of St. Paul, Mrs. Allen Skogebo and Karen Hegge of Austin; his father, and a sister, Mrs. Theodore Heimarck, of Minneapolis.

WILLARD SAMUEL HOWARD

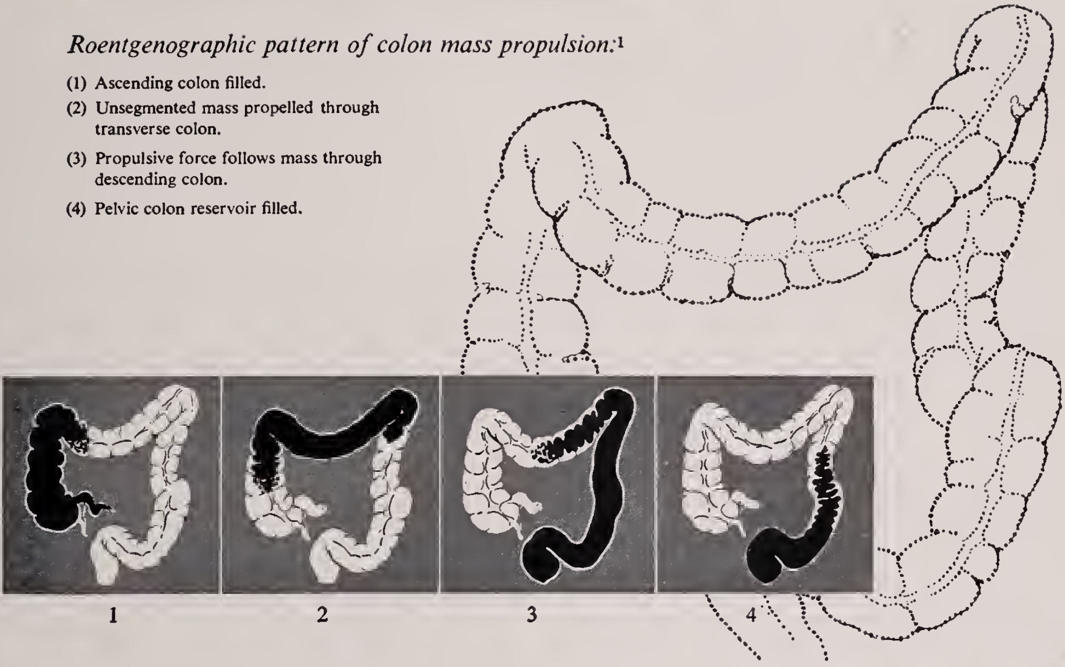
Dr. Willard S. Howard, St. Paul physician, died December 17, 1955, at the age of sixty-six. Born in Rice Lake, Wisconsin, he had been a resident of St. Paul for thirty-five years.

Dr. Howard attended the University of Illinois before serving in the medical corps as a captain during World War I. He was the St. Paul postoffice physician from 1929 to 1946, and then he became associated with the Veterans Administration at Fort Snelling.

He was a member of the Ramsey County Medical Society, the Minnesota State Medical Association and the American Medical Association. He was also a member of the American Legion.

He is survived by two sons, Dr. Robert Howard of Minneapolis, and John, of St. Paul; and a sister, Mrs. Verna Lampman of Austin, Texas.

SMOOTHAGE ACTION IN CONSTIPATION



Roentgenographic pattern of colon mass propulsion:[1]

(1) Ascending colon filled.
(2) Unsegmented mass propelled through transverse colon.
(3) Propulsive force follows mass through descending colon.
(4) Pelvic colon reservoir filled.

Reestablishing Bowel Reflexes with Metamucil®

Nervous fatigue, tension, injudicious diet, failure to establish regularity, too little exercise, excessive use of cathartics—all factors which contribute to constipation.[2]

Sufficient bulk and sufficient fluid form the basic rationale of treatment of constipation. Metamucil (the mucilloid of Plantago ovata) produces a bland, smooth bulk when mixed with the intestinal contents. This bulk, through its mass alone, stimulates the peristaltic reflex and thus initiates the desire to evacuate, even in patients in whom postoperative hesitancy exists.

Correction of constipation logically, therefore, lies in the suitable adjustment of such factors as nervous fatigue and tension, improper intake of fluid, improper dietary habits, failure to respond to the call to stool, lack of physical exercise and abuse of the intestinal tract through excessive use of laxatives.[2]

The characteristics of Metamucil permit the correction of most of these factors: it provides bulk; it demands adequate intake of fluids (one glass with Metamucil powder, one glass after each dose); it increases the physiologic demand to evacuate; and it does not establish a laxative "habit." Metamucil, in addition, is inert, and also nonirritating and nonallergenic.

The average adult dose is one rounded teaspoonful of Metamucil powder in a glass of cool water, milk or fruit juice, followed by an additional glass of fluid if indicated.

Metamucil is the highly refined mucilloid of Plantago ovata (50%), a seed of the psyllium group, combined with dextrose (50%) as a dispersing agent. It is supplied in containers of one pound—also four ounces and eight ounces. G. D. Searle & Co., Research in the Service of Medicine.

---

1. Best, C. H., and Taylor, N.B.: The Physiological Basis of Medical Practice: A Text in Applied Physiology, ed. 5, Baltimore, The Williams & Wilkins Company, 1950, pp. 579-583.
2. Bargen, J. A.: A Method of Improving Function of the Bowel, Gastroenterology *13*:275 (Oct.) 1949.

SEARLE

General Interest

Minnesota physicians are invited to submit items of "general interest" concerning themselves or their colleagues to MINNESOTA MEDICINE, 2642 University Avenue, St. Paul. Only the facts are needed—who? what? where? when? why?—since items will be rewritten for conformity of style.

* * *

Dr. Robert A. Good, American Legion Memorial Heart Research professor at the University of Minnesota, has been given the Theobald Smith award for medical research. The award, consisting of $1,000 and a bronze medal, was presented at the annual meeting of the American Association for the Advancement of Science at Atlanta, Georgia, December 28. It was the second award in three months for Dr. Good, who received one from the American Academy of Pediatrics in October for his studies of agammaglobulinemia.

* * *

Dr. Hamlin Mattson, Minneapolis, spoke on "Causes of Failure in Hernia Surgery" at the annual staff meeting at St. Francis Hospital, Shakopee, on January 5.

* * *

Dr. Joseph C. Houts, Dassel, has been elected chief-of-staff of the Meeker County Memorial Hospital at Litchfield.

* * *

Guest speakers at a meeting of the Aberdeen District Medical Society, Aberdeen, South Dakota, November 2, were **Dr. Edgar G. Ingalls** and **Dr. Russell N. Frys** of Minneapolis. They presented a paper on infertility.

* * *

Dr. C. W. Froats, St. Paul, was inducted into fellowship in the American Academy of Obstetrics and Gynecology at the annual meeting of the organization in Chicago in mid-December.

* * *

At the annual business meeting of the board of governors of the Mayo Clinic, Rochester, on December 21, all officers were re-elected. They are **Dr. Samuel F. Haines**, chairman; Dr. **James T. Priestley**, vice chairman; Dr. **Hugh R. Butt**, second vice chairman, and **J. W. Harwick**, secretary.

* * *

Dr. Ian A. Brown, Minneapolis, presented an inaugural thesis entitled "Temporal Lobe Epilepsy" at a meeting of the Minnesota Society of Neurology and Psychiatry in St. Paul on January 10.

* * *

Dr. A. I. Rajala, Grand Rapids, was married to Maxine Carol Herrlinger, Deer River, at Our Savior's Lutheran Church in Doray on December 3.

* * *

At the annual meeting of the medical staff of Glenwood Hills Hospital, Minneapolis, **Dr. Irving C. Bernstein** was re-elected to serve as chief-of-staff. **Dr. Robert L. Meller** was named vice president, and **Dr. Donald Daggett**, secretary-treasurer. Retiring officers were **Dr. John Schumacher**, former vice president, and **Dr. Jennings Peteler**, former secretary-treasurer.

* * *

Dr. John S. Lundy, professor of anesthesiology in the Mayo Foundation, Rochester, has been named a corresponding member of the Association of Anaesthetists of Great Britain and Ireland. Dr. Lundy founded the section of anesthesiology at the Mayo Clinic in 1924.

* * *

Recently completed in Cannon Falls was a new clinic building, which was constructed by **Dr. Robert E. Molenaar.** In addition to housing **Dr. Molenaar's** offices, the building, which measures 35 by 50 feet, also provides quarters for two other professional men.

* * *

Dr. Walter H. Ude, Minneapolis, was elected third vice president of the Radiological Society of North America at a meeting of the organization in Chicago recently.

* * *

Newly elected officers of the Minnesota Medical Alumni Association for 1956 are **Dr. Byron B. Cochrane**, St. Paul, president; **Dr. V. J. P. Lundquist**, first vice president; **Dr. Sheldon M. Lagaard**, second vice president; **Dr. Leonard A. Borowicz**, secretary, and **Dr. James C. Mankey**, treasurer, all of Minneapolis.

Elected as members of the board of directors were **Dr. Elmer T. Ceder**, **Dr. Kristofer Hagen** and **Dr. Neil M. Palm**, all of Minneapolis.

* * *

Dr. Robert Meyer has been named health officer of Golden Valley. The village council recently appointed him to the post for a one-year term.

* * *

Dr. Frederick P. Moersch, senior consultant in the section of neurology at the Mayo Clinic and professor of neurology in the Mayo Foundation, Rochester, has been elected president of the American Board of Psychiatry and Neurology, Inc. Dr. Moersch has been a director of the board since 1948.

* * *

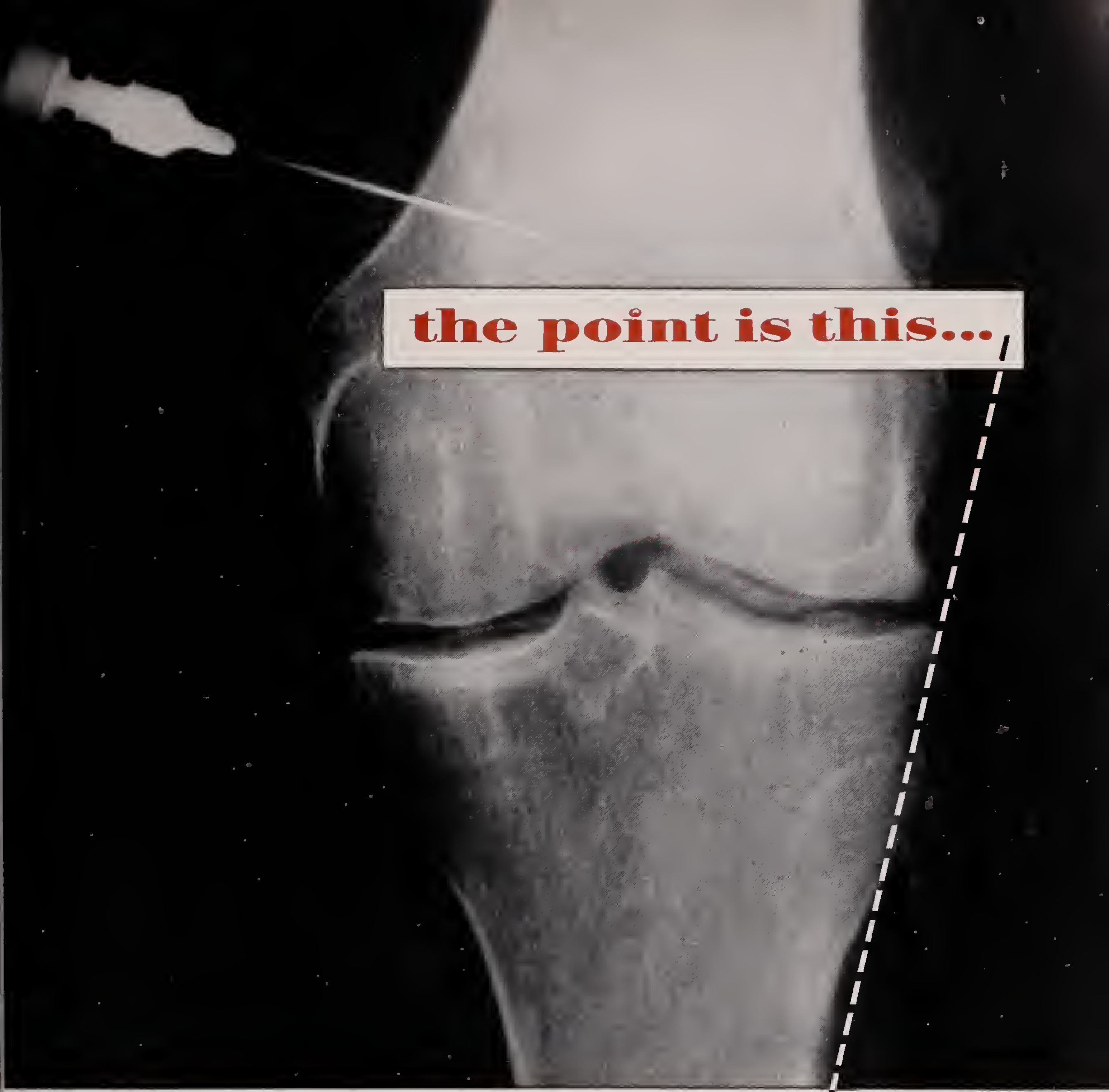
Grand prize offered by the television show "You Should Know" over KSTP-TV on Christmas Day was won by **Dr. J. G. Beaton** of Northfield. For answering a question correctly, Dr. Beaton won a trip for two to anywhere in the world plus $200 expense money. Dr. and Mrs. Beaton selected a trip to Paris as their prize.

* * *

It has been announced that **Dr. Kenneth D. Devine**, Rochester, will present a paper entitled "Carcinoma of the Nose and Paranasal Sinuses" at the convention of the American Medical Association in Chicago on June 12-14.

* * *

Dr. C. R. Stanley has retired from the staff of the



HydroCortone®-TBA

(HYDROCORTISONE TERTIARY-BUTYLACETATE, MERCK)

gives the arthritic patient more days of freedom from joint symptoms—in many patients the anti-rheumatic effect persists 2 to 10 times longer than after injection of hydrocortisone acetate. Its action is local and without systemic effect.

SHARP & DOHME

Philadelphia 1, Pa.
Division of Merck & Co., Inc.

SUPPLIED: SALINE SUSPENSION HYDROCORTONE-TBA—25 MG./CC., VIALS OF 5 CC.

NOW!

You can make your Hyfrecator portable with this New

P & H STAND

- Makes your Hyfrecator portable
- Finished in durable chrome-plate
- Tray at base of board for accessories

A "must" for physicians who carry their Hyfrecator from room to room! Especially designed to supply safe, convenient storage and easy portability. Unit is 27" high, on easy-roll 2" ball-bearing casters. Finished in durable chrome-plate. Mounting board is heat-resistant, acid-proof plastic with walnut-grain finish. Chrome-plated tray at base of mounting board holds footswitch, plug and cords, when not in use.

Write for prices and literature . . . MM-256a.

Physicians & Hospitals Supply Co.

1400 Harmon Place • Minneapolis 3, Minnesota

Worthington Clinic, Worthington, and has moved to Minneapolis. A graduate of Rush Medical College in 1911, Dr. Stanley was one of the founding partners of the Worthington Clinic in 1920. He celebrated his seventy-first birthday on December 30.

* * *

Staff officers of Asbury Methodist Hospital, Minneapolis, for 1956 are **Dr. Robert B. Potter**, president; **Dr. Harold S. Ulvestad**, vice president, and **Dr. Thomas D. Wright**, secretary-treasurer.

* * *

Dr. Frank H. Krusen, head of the section of physical medicine and rehabilitation at the Mayo Clinic and professor in the Mayo Foundation, has been given the 1956 Modern Medicine award for distinguished achievement.

* * *

Dr. Rodney F. Sturley, St. Paul, was elected president of the Minnesota Obstetrical and Gynecological Society at a meeting in St. Paul early in December. Elected as vice president of the organization was **Dr. Frederick L. Schade**, Worthington, with **Dr. Edward A. Banner**, Rochester, secretary-treasurer.

* * *

The combination office and home of **Dr. Herman Linde**, Cyrus, was totally destroyed by fire on January 3. Cause of the blaze was an overheated furnace. Immediately after the fire residents of the community announced that they planned to do whatever possible to help Dr. and Mrs. Linde rebuild.

* * *

Two University of Minnesota physicians took part in the first of a series of closed circuit telecasts entitled "Grand Rounds" on January 18. Among the specialists participating in the televised discussion of management of acute abdominal emergencies were **Dr. Owen H. Wangensteen**, professor and chief of the department of surgery at the University of Minnesota Medical School, and **Dr. Leo G. Rigler**, professor and chief of the department of radiology and physical therapy. The program was sponsored by the Upjohn Company.

* * *

Dr. Robert R. Kierland, Rochester, was re-elected assistant secretary-treasurer of the American Academy of Dermatology and Syphilology at a meeting in Chicago in early December.

* * *

Dr. Herbert F. R. Plass was elected chief of the medical staff of Abbott Hospital, Minneapolis, at a meeting on January 3. Also elected to office were **Dr. Tague C. Chisholm**, vice president; **Dr. Richard R. Fliehr**, secretary; **Dr. Herman E. Drill**, **Dr. Karl E. Sandt** and **Dr. Robert Semsch**, members of the executive committee.

* * *

Recently elected president of the International Federation of Physical Medicine, **Dr. Frank H. Krusen**, Rochester, will preside at the next congress of the organization in Copenhagen, Denmark, in August.

Dr. Thomas Lowry, chief of the medical staff of General Hospital, Minneapolis, and clinical professor of medicine at the University of Minnesota, was named to the Glen Lake Sanatorium commission by the Hennepin County board of commissioners on January 3. He succeeds **Dr. S. Marx White**, who resigned after serving on the commission for thirty-six years.

NEW LOCATIONS

Dr. W. J. Bushard, Minneapolis, has moved his office to new quarters at 849 Medical Arts Building. His telephone number has been changed to FEderal 2-7341.

* * *

Dr. Edward M. LaFond, formerly of the Minneapolis Veterans Hospital, has opened offices for the practice of orthopedic surgery in St. Mary's Building, St. Cloud.

* * *

Dr. W. R. Blomberg, after twenty years of practice at Princeton, has moved to St. Paul and opened offices for the practice of medicine.

* * *

Dr. H. M. Broker, formerly of Eden Valley, has opened offices in St. Mary's Building, St. Cloud, for the practice of surgery.

* * *

Dr. A. G. Sanderson, formerly on the staff of the Anoka State Hospital, has opened offices for the practice of medicine in Ashby.

* * *

Dr. James Lewis, formerly with the White Earth Indian Hospital at Detroit Lakes, has moved to Pine Ridge, South Dakota.

MINNESOTA BLUE SHIELD-BLUE CROSS

Enrollment in Blue Cross and Blue Shield reached a new high during 1955. Approximately 1,027,000 Minnesotans were enrolled in Blue Cross through 388,144 contracts, as of December 31, 1955. This is an increase of 11,006 contracts, representing 26,971 persons over the total as of December 31, 1954.

As of December 31, 1955, Blue Shield enrollment exceeded 729,000 persons enrolled through 275,587 contracts. This represents an increase of 21,575 contracts accounting for 58,705 persons as of December 31, 1954.

Blue Cross has long pursued the policy of offering a variety of contract benefits designed for varying hospital costs throughout the State of Minnesota.

In keeping with this progressive policy, a new nongroup policy is now being offered to Minnesotans. Called the "Optional Series" contract, the new plan affords persons the opportunity to select the room and board coverage that best fits hospital costs of the area in which they reside. Eligible applicants may select any room and board contract from $5 to $20. The new "Optional Series" contracts do not employ the deductible feature.

As a special feature of the professional relations program, a revised edition of the Blue Shield Participation Physicians' Manual was forwarded to each participating physician on December 30, 1955. This revised edition of the Participating Physicians' Manual contains essentially the same information as appeared in the previous

Cleans like magic . . . no more scrubbing with ULMER Kler-ro

ULMER

For surgical instruments, laboratory glassware, rubber goods and linens.

Soaks clean . . . removes dried blood, pyrogens, plasma, serums and mucus . . . eliminates necessity of hand scrubbing.

Will not etch glassware, leaves it sparkling clear. Will not pit stainless steel. Has a nearly neutral pH. Kler-ro does not cake but dissolves quickly and is safe and economical to use.

Write for free sample and brochure today . . .
MM—256b

Physicians & Hospitals Supply Co.
1400 Harmon Place Minneapolis 3, Minn.

edition, published in 1950. However, the revised Manual includes data pertaining to the improvements in the contract, as well as information regarding those services which have been added as benefits and the most recent edition of the Schedule of Payments.

Revised at the request of the Board of Directors, the Manual contains Blue Shield information of interest to physicians. It was written in such a manner as to be an easily adaptable reference for office personnel.

Of particular interest to physicians should be the section pertaining to the subscriber's contract which includes information about the benefits and terms of the contract. The Manual includes sections on reporting services rendered and proper completion of the medical service report, two important factors in assuring the physician and his patient of prompt payment of claims.

The brevity and clarity of the Manual is obvious, in view of the material necessarily included. Although brief, it is complete, for it contains the information needed to obtain the benefits to which the subscriber or patient is entitled under his Blue Shield contract.

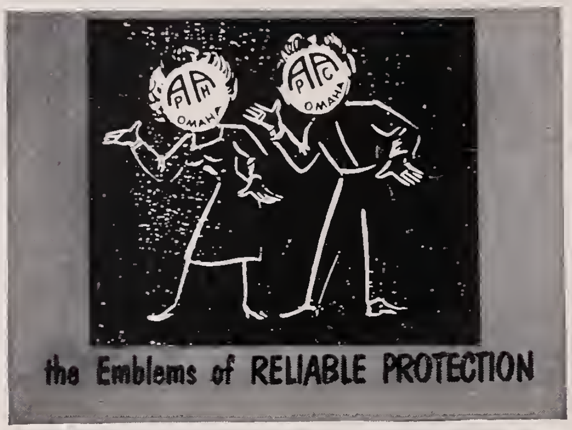
MILITARY DEPENDENTS' HEALTH INSURANCE

(Continued from Page 123)

the terms of the bill, dependents will receive care at military establishments "subject to the availability of space, facilities, and capabilities of the medical staff," but emphasis is placed on a plan of prepaid health insurance. Servicemen are not compelled to enroll for the voluntary plan, which would permit them to receive medical care in either military or civilian facilities, but it is their strongest guarantee of good medical service.

There is a whole new approach to the question of cost. Uninsured dependents unable to gain admittance into military hospitals would have no legal claim for reimbursement of expenses incurred. Other new provisions specify that a serviceman will, through payroll allotment, contribute thirty per cent of the cost of the premium for coverage for his wife and children. He will bear the full cost of coverage for dependent parents. If he wishes more than basic coverage for diagnosis, treatment of acute medical and surgical conditions, treatment of contagious diseases, immunizations and maternity/infant care, he must pay the full amount of the extra premium. If insured dependents choose to receive care in a military installation, the insurance company will pay the bill. Also, at the discretion of the Secretary of Defense, minimal charges may be imposed for outpatient care of dependents at military medical facilities.

WE CORDIALLY INVITE YOUR INQUIRY for application for membership which affords protection against loss of income from accident and sickness (accidental death, too) as well as benefits for hospital expenses for you and all your eligible dependents.


APH
OMAHA
APC
OMAHA
the Emblems of RELIABLE PROTECTION

SINCE 1902

ALL PREMIUMS COME FROM

PHYSICIANS
SURGEONS
DENTISTS

ALL BENEFITS GO TO

$4,500,000 ASSETS
$22,500,000 PAID FOR BENEFITS

PHYSICIANS CASUALTY
AND
HEALTH ASSOCIATIONS
OMAHA 2, NEBRASKA

n arthritis
and
allied disorders...

onhormonal anti-arthritic

BUTAZOLIDIN®

(brand of phenylbutazone)

elieves pain • improves function • resolves inflammation

Employing the serum protein-polysaccharide ratio (PR) as an objective criterion of rheumatoid activity, it has again been shown that BUTAZOLIDIN "...produces more than a simple analgesic effect in rheumatoid arthritis."[1]

Clinically, the potency of BUTAZOLIDIN is reflected in the finding that 57.6 per cent of patients with rheumatoid arthritis respond to the extent of "remission" or "major improvement."[2]

Long-term study has now shown that the failure rate with BUTAZOLIDIN in rheumatoid arthritis, and particularly in rheumatoid spondylitis, is significantly lower than with hormonal therapy.[3]

(1) Payne, R. W.; Shetlar, M. R.; Farr, C. H.; Hellbaum, A. A., and Ishmael, W. K.: J. Lab. & Clin. Med. 45:331, 1955. (2) Bunim, J. J.; Williams, R. R., and Black, R. L.: J. Chron. Dis. 1:168, 1955. (3) Holbrook, W. P.: M. Clin. North America 39:405, 1955.

BUTAZOLIDIN® (brand of phenylbutazone). Red coated tablets of 100 mg.

BUTAZOLIDIN being a potent therapeutic agent, physicians unfamiliar with its use are urged to send for literature before instituting therapy.

GEIGY PHARMACEUTICALS Division of Geigy Chemical Corporation
220 Church Street, New York 13, N. Y.
In Canada: Geigy Pharmaceuticals, Montreal

Geigy

51155

specify

Lederle

POLIOMYELITIS
IMMUNE GLOBULIN
(human)

For the modification of
measles and the prevention
or attenuation of infectious
hepatitis and poliomyelitis.

LEDERLE LABORATORIES DIVISION
AMERICAN Cyanamid COMPANY
PEARL RIVER, NEW YORK

NEW!
Patented HANSEN
Split Frame Truss

Positive Hernia Control
Contoured Spring Design Gives
Custom Made Comfort
Unlimited Body Activity
Single with Dummy illustrated
Double not illustrated

C. F. ANDERSON CO., INC.

901 Marquette
Minneapolis, Minnesota

Book Reviews

Books listed here become the property of the Ramsey, Hennepin and St. Louis County Medical Libraries when reviewed. Members, however, are urged to write reviews of any or every recent book which may be of interest to physicians.

THE FIGHT AGAINST TUBERCULOSIS; A AUTOBIOGRAPHY. By Francis Marion Potteng M.D. 276 pages. Illus. Price $4.00. New York: Hen Schuman, 1952.

This autobiography is especially interesting becau of the many interesting anecdotes that the author rela about his life as a boy on the farm. His vivid descri tion of his college and medical training are worthwh reading.

The death of his wife due to tuberculosis develop in the author an intense desire to learn more abo the disease. He ended up learning so much that soon became a world authority on the disease and add much to our information at a time when few were doi anything about the "White Plague" except saying th it was a hopeless disease.

Donald W. Koza, M.

HOOKWORM TREATMENT OF POLYCYTHEMIA VERA

(Continued from Page 100)

Summary

A patient with polycythemia vera was giv larvae of *Ancylostoma duodenale* for therapy chronic low-grade blood loss instead of the inte mittent large volume blood loss of venesecti which was so objectionable to the patient. T patient is well and very pleased after fourte months of observation. Without venesection, t hematocrit has remained stable. The results in o patient seem very satisfactory and further consi eration of this form of treatment and further tri is indicated.

References

1. Brumpt, L. C., and Gujar, B. J.: The treatment polycythemia vera by artificial infection with cylostoma duodenale. Indian Medical Gazette, 8 166 (April) 1948.
2. Duvoir, M.; L. Pollet, and L. C. Brumpt: Un de polyglobulie chez une arteriopathique tra depuis trois ans par ankylostomose provoquee. Sa 15:81, 1942.
3. Nagaty, H. F., and Zanaty, A. F.: The treatm of polycythemia vera. A record of one case trea with ancylostoma infection. Tr. Roy. Soc. Tr Med. & Hyg., 42:493 (March) 1949.
4. Personal communication from Dr. C. J. Watson.

A complete Infant Food
BAKER'S
MODIFIED MILK
Made from Grade A Milk
Liquid form
BAKER'S
MODIFIED MILK
Made from Grade A Milk
Powder form
ESPECIALLY PREPARED FOR THE FIRST YEAR OF INFANT FEEDING
For the Bottle fed Baby
THE BAKER LABORATORIES
made from
GRADE A MILK*
EITHER
POWDER OR LIQUID

Both forms of Baker's Modified Milk—Powder and Liquid—contain all requirements for complete infant nutrition and may be fed interchangeably.

The Powder form is particularly adaptable for feeding prematures, and for use as complemental or supplemental feedings.

For routine infant feeding, the Liquid is generally preferred because of its greater ease of preparation.

Both forms of Baker's Modified Milk are supplied gratis to all hospitals for your use.

Normal Dilutions

20 calories per ounce

Liquid form—1 fl. oz. milk to 1 fl. oz. water

Powder form—1 Tbsp. powder to 2 fl. oz. of water.

*U. S. Public Health Service Milk Code

THE BAKER LABORATORIES, INC.

Milk Products Exclusively for the Medical Profession

***Main Office:* Cleveland 3, Ohio • *Plant:* East Troy, Wisconsin**

A MODERN PRIVATE SANITARIUM

for the Diagnosis, Care and Treatment of Nervous and Mental Disorders

MAIN BUILDING—One of 10 Units in "Cottage Plan"

ST. CROIXDALE ON LAKE ST. CROIX

PRESCOTT, WISCONSIN

Located on beautiful Lake St. Croix, 18 miles from the Twin Cities, it has the advantages of both City and Country. Every facility for treatment provided, including recreational activities and occupational-therapy under trained personnel. Close personal supervision given patients, and modern methods of therapy employed. Inspection and cooperation by reputable physicians invited. Rates very reasonable. Illustrated folder on request.

Prescott Office
Prescott, Wisconsin
Howard J. Laney, M.D.
Tel. 39 and Res., 76

Consulting Neuro-Psychiatrists
Hewitt B. Hannah, M.D., Andrew J. Leemhuis, M.D.
527 Medical Arts Bldg., Tel. FE. 2-1357, Minneapolis, Minn.

Superintendent
Ella M. Leseman
Prescott, Wisconsin
Tel. 69

"Premarin" relieves menopausal symptoms with virtually no side effects, and imparts a highly gratifying "sense of well-being."

"Premarin" ®—Conjugated Estrogens (equine)

Professional Insurance Covers Your Complete Needs

A professional liability insurance program has been developed especially for you as a member of the Minnesota Medical Association. It provides complete coverage for you as an individual, as a partner, or in the operation of a clinic.

Choice of the Minnesota Medical Association for professional liability insurance.

There is a St. Paul Agent in your community as close as your phone. Or contact your state secretary for information.

ST. PAUL FIRE AND MARINE • CO • ST. PAUL MERCURY INDEMNITY CO • MERCURY INSURANCE CO.

The Saint Paul Companies
SINCE 1853
INSURANCE
LAND • SEA • AIR

HOME OFFICE
111 West Fifth Street
St. Paul 2, Minnesota

Crestview Hospital
C H
SAINT PAUL

A non-profit organization

Occupational therapy department.

CRESTVIEW
NEUROPSYCHIATRIC HOSPITAL

145 W. College Ave.... CApital 4-5841
SAINT PAUL, MINNESOTA

Highest standard of service and facilities for over 15 years.

AMERICAN HOSPITAL ASSOCIATION
NISI DOMINUS FRUSTRA
MEMBER

The only non-profit specialized hospital in St. Paul devoted exclusively to the treatment and care of neuropsychiatric patients.

Ultra modern facilities and comforts at the lowest cost to patients.

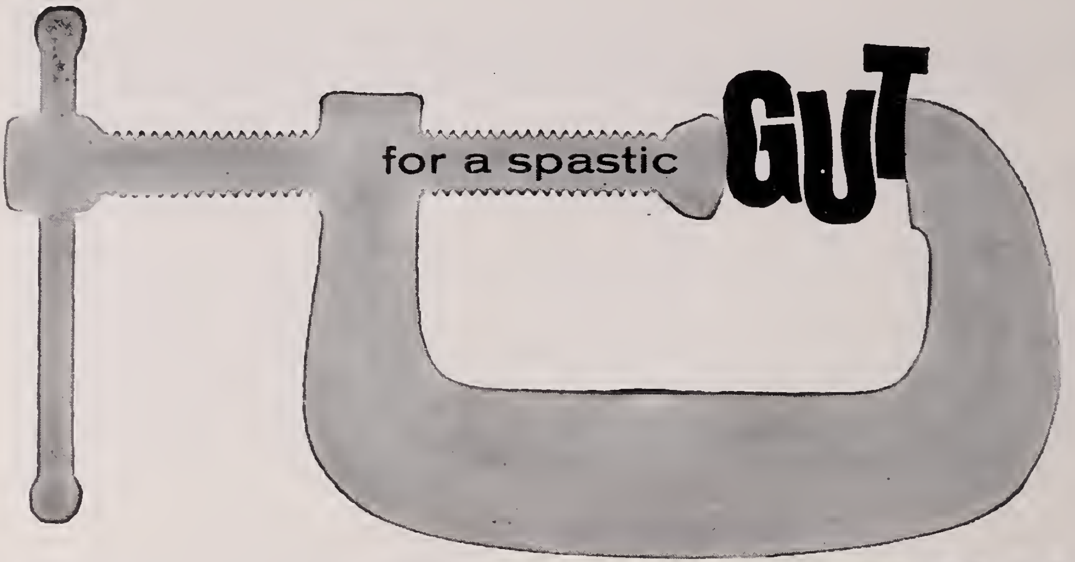
- Occupational therapy and recreational department.
- Complete X-ray- and- laboratory.
- Electrocardiography — basal metabolism.
- Electroencephalography available.
- All patients rooms air-conditioned.
- Background music and psychotherapy sound equipment.
- Medically staffed by every neurologist and psychiatrist in St. Paul.
- Especially trained nursing staff.

MEMBER of the American Hospital Association

MEMBER of the Minnesota Hospital Association

APPROVED by the Minnesota State Medical Association and the Ramsey County Medical Society.

Send for photo brochure and rate schedule.


for a spastic
GUT

Trasentine®-Phenobarbital

integrated relief . . .
mild sedation
visceral spasmolysis
mucosal analgesia

TABLETS (yellow, coated), each containing 50 mg. Trasentine® hydrochloride (adiphenine hydrochloride CIBA) and 20 mg. phenobarbital.

2/2228M

C I B A
Summit, N.J.

ABC-TV
MEDICAL HORIZONS TV Monday P.M.
Sponsored by CIBA

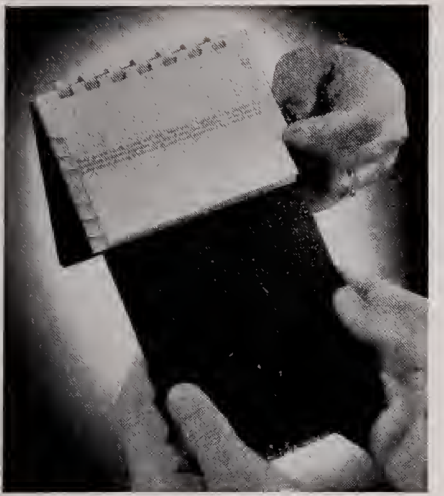
Relax the best way ...pause for Coke

DRINK
Coca-Cola
Work
Refreshed
Coca-Cola

continuous quality is quality you trust

DRINK
Coca-Cola
REG. U.S. PAT. OFF.

A New Departure in Near Vision Testing



Eleven pages. Over-all size of test book . . . 4¾″ wide x 8¼″ long.

The FINK NEAR VISION TEST book — *with only one size type on a page* — is a complete departure from the usual near vision test.

These are some of its advantages:

- Only one size type on a page
- Percentage rating, Jaeger designation, and inch designations on each page
- Durable plastic construction
- Completely washable
- Pages notched on left and right for easy turning
- Comfortably held by patient during test
- Has illiterate chart

Write or call your nearest BENSON LABORATORY *for further details.*

Since 1913 Benson OPTICAL COMPANY ***Executive Offices • Minneapolis 2, Minn.***

COMPLETE LABORATORIES CONVENIENTLY LOCATED IN UPPER MIDWEST CITIES

DANIELSON MEDICAL ARTS PHARMACY, INC.

PHONES:
FEderal 3-3317
FEderal 3-3318

10-14 Arcade, Medical Arts Building
825 Nicollet Avenue—Two Entrances—78 South Ninth Street
MINNEAPOLIS

HOURS:
WEEK DAYS—8 to 7
SUN. & HOL.—10 to 1

Insurance at a Saving

Druggists' Mutual Insurance Company
OF IOWA, ALGONA, IOWA
Fire - Tornado - Automobile Insurance

Prompt Loss Service

MINNESOTA REPRESENTATIVE—S. E. STRUBLE, WYOMING, MINN.

Brown & Day, Inc.

Supply Warm Moist Air
the Modern Way with . .

MYRICK INHALATOR

Based on a new principle of operation, assuring delivery of a steady flow of highly saturated vapor at an acceptable temperature.

Patient may shift position, sleep, or rest. No hood or cone needed except in extreme cases.

Safe, portable, easy to use. Operates 10 hours continuously with one filling.

MAY WE SEND YOU A
DESCRIPTIVE FOLDER?

"Everything for the Physician"

for fast service call CA 2-1845

SERVICE BROWN & DAY INC SAINT PAUL USA QUALITY

62-64 EAST 5TH ST
St. Paul 1, Minn.

THE BANK
WHERE YOU
FEEL AT
HOME

the AMERICAN
NATIONAL BANK OF SAINT PAUL
MEMBER FEDERAL DEPOSIT INSURANCE CORPORATION

GLYCAMINE®
TABLETS

For Peptic Ulcers and Hyperacidity

Available All Drug Stores

Distributed by
DALCO PHARMACAL CO.
Minneapolis, Minnesota

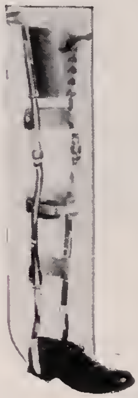
Cook County Graduate School of Medicine

INTENSIVE POSTGRADUATE COURSES
STARTING DATES—WINTER-SPRING, 1956

SURGERY—Surgical Technique, two weeks, March 19, April 2
Surgical Anatomy and Clinical Surgery, two weeks, March 5
Surgery of Colon and Rectum, one week, April 9, May 7
General Surgery, two weeks, April 23
Basic Principles in General Surgery, two weeks, April 9
Gallbladder Surgery, ten hours, April 9
Fractures and Traumatic Surgery, two weeks, March 12
Varicose Veins, ten hours, March 19, April 30
GYNECOLOGY—Office and Operative Gynecology, two weeks, March 12, April 16
Vaginal Approach to Pelvic Surgery, one week, March 5, April 30
OBSTETRICS—General and Surgical Obstetrics, two weeks, March 26, May 7
MEDICINE—Internal Medicine, two weeks, May 7
Electrocardiography and Heart Disease, two-week basic course, March 12
Gastroscopy, forty-hour course, March 19
Dermatology, two weeks, May 7
RADIOLOGY—Diagnostic X-ray, two weeks, April 30
Clinical Use of Radioactive Iodine, one week, April 2
Clinical Uses of Radioisotopes, two weeks, May 7
PEDIATRICS—Intensive Review Course, two weeks, May 14
Neurological Diseases: Cerebral Palsy, two weeks, June 18
UROLOGY—Two-week Course, April 16
Cystoscopy, ten days, by appointment

TEACHING FACULTY—ATTENDING
STAFF OF COOK COUNTY HOSPITAL

ADDRESS: REGISTRAR, 707 South Wood Street,
Chicago 12, Illinois



RELIABILITY

For years we have maintained the highest standards of quality, expert workmanship and exacting conformity to professional specifications . . . a service appreciated by physicians and their patients.

ARTIFICIAL LIMBS, TRUSSES,
ORTHOPEDIC APPLIANCES,
SUPPORTERS, ELASTIC HOSIERY

Prompt, painstaking service

Buchstein-Medcalf Co.
223 So. 6th St. Minneapolis 2, Minn.

RADIUM RENTAL SERVICE
4340 CEDARWOOD ROAD
MINNEAPOLIS 5, MINNESOTA
TEL. FE 3-5297

Radium element prepared in type of applicator requested

ORDER BY TELEPHONE OR MAIL
PRICES ON REQUEST

Upjohn
KALAMAZOO

Indicated wherever oral cortisone or hydrocortisone is effective Available in 5 mg. tablets in bottles of 30 and 100 Usual dosage is ½ to 1 tablet three or four times daily

Deltasone*

requires only 1/5 the dose of cortisone

*Trademark for the Upjohn brand of prednisone (delta-l-cortisone)

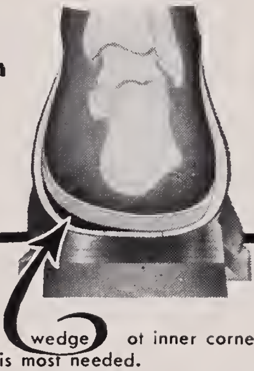
THE
MEDICAL PROTECTIVE
COMPANY
FORT WAYNE, INDIANA

unique
in successfully fighting malpractice charges

PROFESSIONAL PROTECTION
EXCLUSIVELY
SINCE 1899

MINNEAPOLIS Office:
Robert L. McFerran, Rep.,
311 East 24th St., Apt. A-1
Telephone Federal 9-1292
Donald D. Martin, Rep.,
318 E. 25th St., Apt. D-8
Telephone Federal 6-8751

Foot-so-Port Shoe Construction and its Relation to Weight Distribution



- Insole extension and wedge at inner corner of heel where support is most needed.
- Special Supreme rubber heels are longer than most anatomic heels and maintain the appearance of normal shoes.
- The patented arch support construction is guaranteed not to break down.
- Innersoles are guaranteed not to crack, curl, or collapse. Insulated by a special layer of Texon which also cushions firmly and uniformly.
- Foot-so-Port lasts were designed and the shoe construction engineered with orthopedic advice.

NOW AVAILABLE! Men's conductive shoes. N.B.F.U. specifications. For surgeons and operating room personnel.

- By a special process, using plastic positive casts of feet, we make more custom shoes for polio, club feet and all types of abnormal feet than any other manufacturer.

Write for details or contact your local **FOOT-SO-PORT** *Shoe Agency. Refer to your Classified Directory*

Foot-so-Port Shoe Company, Oconomowoc, Wis.

Classified Advertising

Replies to advertisements with key numbers should be mailed in care of MINNESOTA MEDICINE, *2642 University Avenue, Saint Paul 14, Minnesota.*

WANTED—Young General Practitioner, also young Internist to join small group consisting of Pediatrician, General Practitioner and General Surgeon in Minneapolis. Building is entirely new and designed for group practice. Address E-504, care MINNESOTA MEDICINE.

WANTED—Board-certified or board-eligible ophthalmologist. Group of thirteen doctors in small midwest community. Liberal starting salary and partnership after one year. Address E-510, care MINNESOTA MEDICINE.

WANTED—General practitioner for State Hospital. Salary range $641 to $781 per month. Quarters available, subsistence, laundry, and garage. Government working conditions, paid holidays, vacation, sick leave, and retirement pension plan. Write Superintendent, Fergus Falls State Hospital, Fergus Falls, Minnesota.

WANTED—Associate in general practice, with experience in general surgery. Small town, surrounding territory, 7,500 people. House calls infrequent. Modern 24-bed hospital ready in 1957. Present 16-bed hospital well equipped. Modern house available. Modern schools. Unlimited hunting and fishing in nearby Lake Vermillion. Please state qualifications in application. Salary open. Address E-512, care MINNESOTA MEDICINE.

WANTED—Assistant in General Practice in Central Minnesota. Prosperous community—good hunting and fishing. New 32-bed hospital. Address E-514, care MINNESOTA MEDICINE.

WANTED—Residents in Psychiatry. Opportunity for beginning and advanced candidates in five-year Minnesota State Program offered in collaboration with University of Minnesota and Mayo Foundation. Must be acceptable to above training centers. Stipends $5,000 to $7,000. Direct reply to Dale C. Cameron, M.D., Medical Director, Minnesota State Department Welfare, 117 University Avenue, Saint Paul 1, Minnesota, giving full information about training and experience.

FOR RENT OR SALE—Eight-room, first-floor physician's office. Well equipped. Near Twin Cities. Gross over $30,000. New hospital—unlimited privileges. Good opportunity. Write E-511, care MINNESOTA MEDICINE.

LOCATION AVAILABLE—Established medical location in Appleton, Wisconsin. Uptown business district, over prescription drug store. Six-room suite, large enough for two doctors. Will completely remodel. Rental $75.00 per month. Write or phone collect: B. E. Schwandt, Schlintz Drug Store, Appleton, Wisconsin. Phone 3-5645.

DOCTOR OR DENTIST—Beautiful suite in South Minneapolis. Very modern. Six months free rent. Then option of lease at very reasonable rent. Wm. L. Cochrane, 4101 - 42nd Avenue South, Minneapolis, Minnesota. Telephone Ro 9-8758.

FOR RENT—Highland Shopping Area, equipped office available, full or part time. Share with surgeon and dentist. Excellent for general practice, obstetrics, pediatrics. H. Schwyzer, M.D., 2069 Ford Parkway, Saint Paul. Telephone: MI 8-4832 or CA 4-7416.

ATTENTION DENTISTS AND DOCTORS—Modern space available for dentists' and doctors' offices. A location where several sets of doctors and dentists have been long established and then built their own clinics. A money maker. Above Kisch's Food Market. Plenty of auto parking space. Apply 637 Stryker Avenue, Saint Paul, Minnesota.

FOR RENT—Medical Building in Hillcrest Shopping Center now completed. Two-thirds of Medical Offices occupied. Three suites still available. Building modernly equipped with convenient facilities, air-conditioning, ample parking and centrally located in Northwest's fastest growing Center. Ten thousand patrons within walking distance. Approximately 75,000 residents serviced by Hillcrest Center. Call or write Hillcrest Development, 1457 University Avenue, Saint Paul, Minnesota. MI 5-5829.

FOR SALE—Picker X-Ray, E.K.G., B.M.R., new diathermy, complete laboratory equipment, office furniture, two new examining room units, waiting room chrome, and other items, all in good condition. Address E-516, care MINNESOTA MEDICINE.

PHYSICIAN WANTED at once. Good location. Local municipal hospital. For further information, write E-515, MINNESOTA MEDICINE.

REMEMBER—

"SAFETY-SEAL" and "PARAGON" ILEOSTOMY, URETEROSTOMY, COLOSTOMY SETS!

THEY—assure highest standards of COMFORT, CLEANLINESS, SAFETY for your patients.
—are unnoticeable when worn under girdle or corset.
—provide 24-hour control. Light-weight plastic pouch is disposable, inexpensive. AND their construction is adaptable to any enterostomy, prevents leakage, permits complete emptying, militates against stagnation of waste, protects against odor.

Order from your surgical supply dealer. Write for Medical Journal Reprints and literature from

THOMAS FAZIO LABORATORIES (Surgical Appliance Division) 339 Auburn St., Auburndale 66, Mass.
Originators of CLINIC DROPPER

The Birches Sanitarium, Inc.
2391 Woodland Avenue
Duluth 3, Minnesota

A hospital for the care and treatment of Nervous and Mental disorders. Quiet, cheerful environment. Specially trained personnel. Recreational and occupational therapy.

Dr. L. R. Gowan, M.D., M.S., Medical Director

Index to Advertisers

Abbott Laboratories A-20, A-21
Aloe, A. S., Co. A-8
American National Bank A-46
Ames Co. .... Cover III
Anderson, C. F., Co., Inc. A-40
Ayerst (Premarin) A-42

Baker Laboratories A-41
Benson Optical Co. A-45
Birches Sanitarium, Inc. A-49
Brown & Day, Inc. A-46
Buchstein-Medcalf Co. A-46
Burroughs Wellcome & Co. A-28

Caswell-Ross Agency 90-A
Ciba A-44
Classified Advertising A-48
Coca-Cola A-44
Cook County Graduate School of Medicine A-46
Crestview Hospital A-43

Dalco Pharmacal Co. A-18, A-46
Danielson Medical Arts Pharmacy, Inc. A-45
Druggists Mutual Insurance Co. A-45

Fazio, Thos., Laboratories A-48
Foot-so-Port Shoe Co. A-47

Geigy Pharmaceuticals A-39
General Electric A-22

Hazelden Foundation 90-D
Hoffmann-LaRoche .... Facing A-16
Homewood Hospital A-49

Juran & Moody, Inc. A-26

Knox, Chas. B., Gelatine Co. A-11

Lakeside Laboratories A-25
Lederle Laboratories 90-B, 90-C, A-40
Lilly, Eli, & Co. .... Cover I, A-32

Mayo Clinic—Clinical Reviews 90-D
Mead Johnson & Co. .... Cover IV
Medical Protective Co. A-47

National Drug Co. A-24

Parke, Davis & Co. .... Cover II, A-1
Pfizer Laboratories, Div. of
  Chas. Pfizer & Co. A-13, A-17
Physicians Casualty & Health Associations A-38
Physicians & Hospitals Supply Co. A-36, A-37

Radium Rental Service A-46
Riker Laboratories A-19

St. Croixdale Sanitarium A-42
St. Paul Fire & Marine Insurance Co. A-43
Schering Corporation A-14, A-15, A-30, A-31
Searle, G. D., & Co. A-33
Sharp & Dohme A-9, A-27, A-35
Squibb A-10

United Insurance Company of America A-16
Upjohn A-23, A-47

Viceroy Cigarettes A-12

Winthrop Laboratories A-50
Wyeth A-29

HOMEWOOD HOSPITAL is one of the Northwest's outstanding hospitals for the treatment of Nervous Disorders equipped with all the essentials for rendering high-grade service to patient and physician.

Operated in Connection with
Glenwood Hills Hospitals

HOMEWOOD HOSPITAL
Corner Penn and Plymouth Avenues North
Minneapolis Minnesota

BUS STOP
MAIL

In Colds • • • *Anywhere... Any time...*

Neo-Synephrine®

hydrochloride

Prompt and Prolonged Decongestion
Sinus Drainage and Aeration

NO IRRITATION • NO SEDATION • NO EXCITATION

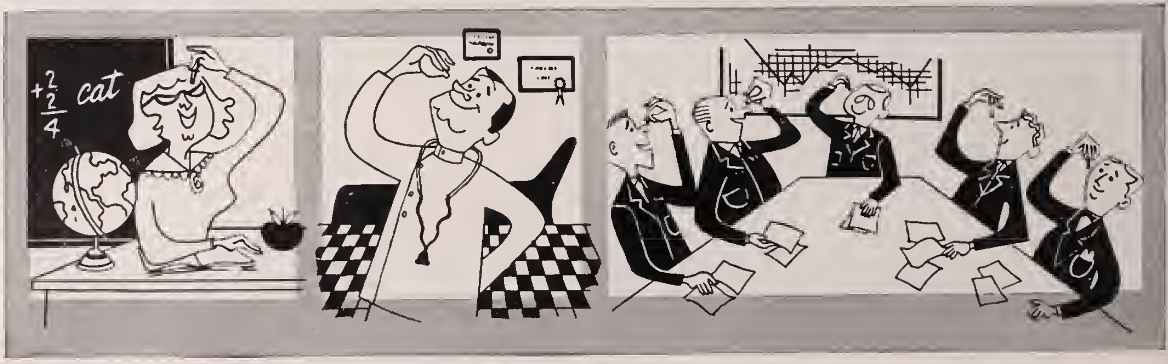
- ✳ **Nasal Solutions** 0.25%, 0.5% and 1%
- ✳ **Nasal Spray** 0.5%
- ✳ **Pediatric Nasal Spray** 0.25%,

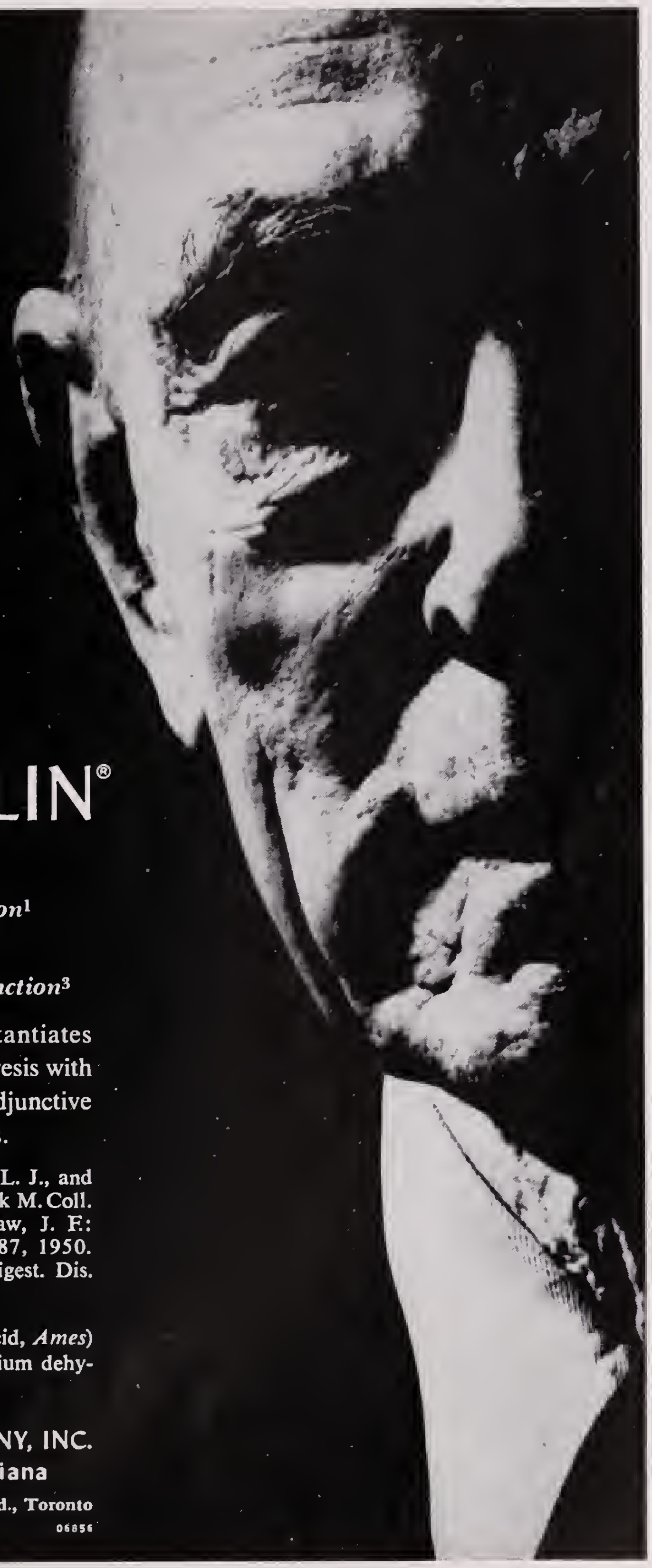
} *plastic, unbreakable squeeze bottle leakproof, delivers a fine mist*

with Zephiran® chloride 1:5000, antibacterial wetting agent and preservative for greater efficiency

Neo-Synephrine (brand of phenylephrine)
and Zephiran (brand of benzalkonium,
as chloride, refined),
trademarks reg. U.S. Pat. Off.

Winthrop LABORATORIES
NEW YORK 18, N. Y. • WINDSOR, ONT.





routine physiologic support for your aging patients

"therapeutic bile"

DECHOLIN®

one tablet t.i.d.

to improve liver function[1]
to produce fluid bile[2]
to restore intestinal function[3]

Clinical evidence substantiates the value of *hydro*choleresis with *Decholin* as routine adjunctive therapy in older patients.

(1) Schwimmer, D.; Boyd, L. J., and Rubin, S. H.: Bull. New York M. Coll. *16*:102, 1953. (2) Crenshaw, J. F.: Am. J. Digest. Dis. *17*:387, 1950. (3) King, J. C.: Am. J. Digest. Dis. *22*:102, 1955.

Decholin (dehydrocholic acid, *Ames*) and *Decholin Sodium* (sodium dehydrocholate, *Ames*).

AMES COMPANY, INC.
Elkhart, Indiana
Ames Company of Canada, Ltd., Toronto
06856

Sick patients need food for therapy

Sustagen

Therapeutic Food for
Complete Nourishment

THAT MAN MUST EAT to remain well is a concept as old as medicine. But only recently has it been established (1) that nutritional needs are increased in illness; (2) that food sufficient to meet these needs is well utilized, and (3) that therapeutic nutrition prevents many of the debilitating effects of disease and injury.

Unfortunately, because of the anorexia accompanying illness, effective nutritional therapy requires added care on the part of the physician. Food comes from familiar kitchens and lacks the impressive aura of more dramatic therapeutic agents. Thus it is often difficult to convince the patient that food, too, is therapeutic—that although drugs may arrest disease only food can repair the ravages of disease.

Whatever the nutritional problem—whether caused by anorexia, mechanical difficulty in eating or limitation of gastric capacity or tolerance—only an assured food intake will solve it. The use of Sustagen, a food formulated for therapeutic nourishment, will overcome many difficulties in the therapeutic feeding of sick patients. A foundation for therapy thus may be established.

The development of Sustagen exemplifies the continuous effort of Mead Johnson & Company to provide the medical profession with products basic to the management of illness and the restoration of health.

Sustagen® is the only single food which contains all known nutritional essentials: protein, carbohydrate, fat, vitamins and minerals. It may be given by mouth or tube as the only source of food or to fortify the diet in brief or prolonged illness.

Sustagen

repairs tissue
restores appetite
overcomes asthenia

in

cirrhosis
peptic ulcer
geriatrics
infections
trauma
chronic disease

MEAD

SYMBOL OF SERVICE IN MEDICINE

MEAD JOHNSON & COMPANY, EVANSVILLE 21, INDIANA, U.S.A.

MSMA Annual Meeting—Rochester, May 21-23, 1956

COLLEGE OF PHYSICIANS
LIBRARY
DEC 13 1956
OF PHILADELPHIA

Minnesota MEDICINE

PUBLISHED MONTHLY BY THE MINNESOTA STATE MEDICAL ASSOCIATION

Volume 39 MARCH, 1956 Number 3

Printed in U.S.A. (Table of Contents—Pages A-2 and A-3) 40c a copy—$3.00 a year

Bronchitis generally responds within a few hours to

ILOTYCIN

(ERYTHROMYCIN, LILLY)

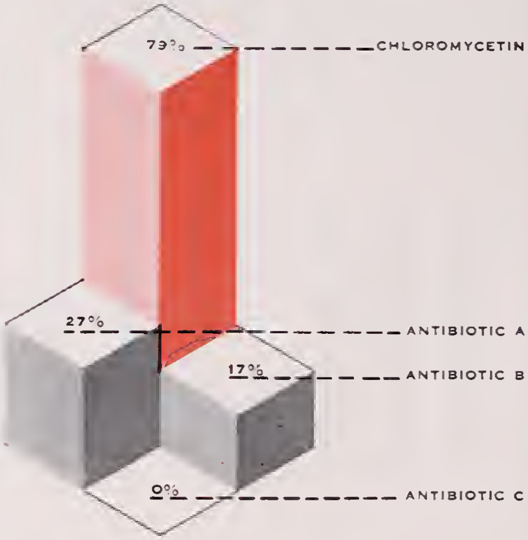
The common pathogens are rapidly destroyed; infection resolves and soreness diminishes. Notably safe and well tolerated.

dosage: 250 or 500 mg. q. 6 h. Children, 5 mg. per pound of body weight q. 6 h.

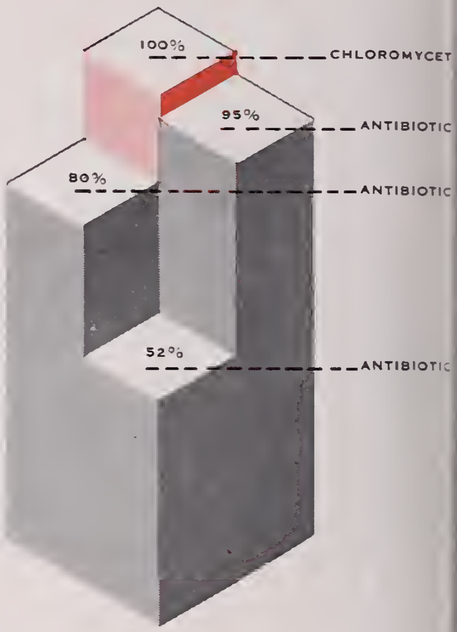
Lilly

532233

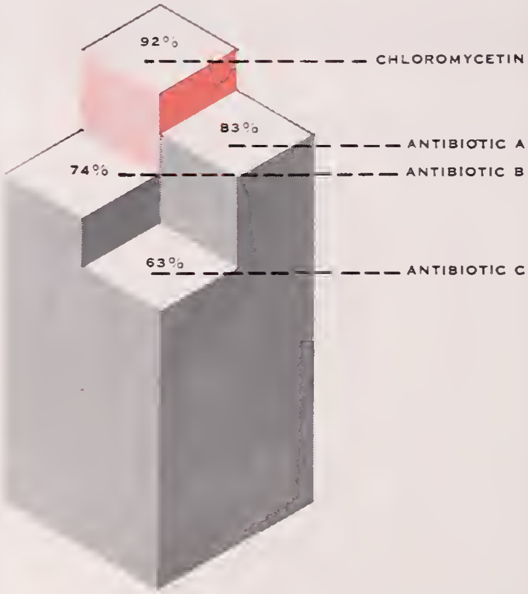
SENSITIVITY OF COMMON PATHOGENS TO CHLOROMYCETIN AND THREE OTHER MAJOR ANTIBIOTIC AG



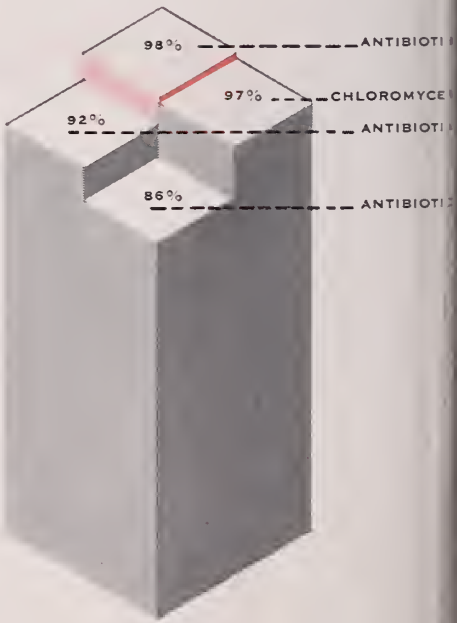
PROTEUS GROUP
(431-506 STRAINS)



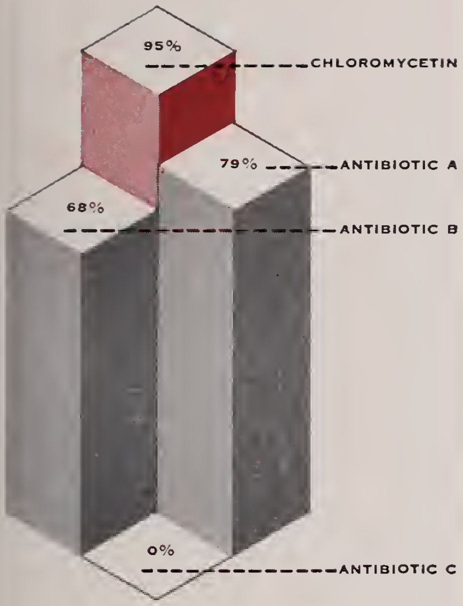
STREPTOCOCCUS VIRIDANS
(42-58 STRAINS)



NONHEMOLYTIC STREPTOCOCCUS
(109-141 STRAINS)



HEMOLYTIC STREPTOCOCCUS
(179-197 STRAINS)



AEROBACTER FECALIS
(14-21 STRAINS)

effective against more strains

Chloromycetin®

for today's problem pathogens

Resistant microorganisms frequently cause poor, delayed, or no response to antibiotic therapy. Because *in vitro* sensitivity tests are valuable guides in determining the antibiotic most likely to produce optimal clinical response, it is important that such tests be employed whenever possible. Recent clinical and laboratory studies[1-12] show that CHLOROMYCETIN (chloramphenicol, Parke-Davis) is effective against more strains of microorganisms than other commonly used antibiotics.

CHLOROMYCETIN is a potent therapeutic agent and, because certain blood dyscrasias have been associated with its administration, it should not be used indiscriminately or for minor infections. Furthermore, as with certain other drugs, adequate blood studies should be made when the patient requires prolonged or intermittent therapy.

references: (1) Altemeier, W. A.; Culbertson, W. R.; Sherman, R.; Cole, W.; Elstun, W., & Fultz, C. T.: *J.A.M.A.* 157:305, 1955. (2) Weil, A. J., & Stempel, B.: *Antibiotic Med.* 1:319, 1955. (3) Jones, C. P.; Carter, B.; Thomas, W. L., & Creadick, R. N.: *Obst. & Gynec.* 5:365, 1955. (4) Austrian, R.: *New York J. Med.* 55:2475, 1955. (5) Murphy, F. D., & Waishren, B. A., in Murphy, F. D.: Medical Emergencies: Diagnosis and Treatment, ed. 5, Philadelphia, F. A. Davis Company, 1955, P. 557. (6) Felshin, G.: *J. Am. M. Women's A.* 10:51, 1955. (7) Kass, E. H.: *Am. J. Med.* 18:764, 1955. (8) Tehrock, H. E., & Young, W. N.: *New York J. Med.* 55:1159, 1955. (9) Stein, M. H., & Gechman, E.: *New England J. Med.* 252:906, 1955. (10) Branch, A.; Starkey, D. H.; Rodgers, K. C., & Power, E. E., in Welch, H., & Marti-Ibáñez, F.: Antibiotics Annual, 1954-1955, New York, Medical Encyclopedia, Inc., 1955, p. 1125. (11) Munroe, D. S., & Cockcroft, W. H.: *Canad. M. A. J.* 72:586, 1955. (12) Norris, J. C.: *M. Times* 83:253, 1955.

h is adapt-
Altemeier,
on, Sher-
e, Elstun,
It repre-
second and
g part of
ented in a
ssue.

MEDICAMENTA VERA

PARKE, DAVIS & COMPANY
DETROIT, MICHIGAN

Volume 39

Minnesota

Contents for

SCIENTIFIC ARTICLES

ORIGINAL CONTRIBUTIONS

The Importance of the Pulmonary Nodule
Donald L. Paulson, M.D., Dallas, Texas 127

Laryngocele—Laryngeal Air-sac of Lower Animals Appearing in Man
William J. Kucera, Jr., M.D., and *Robert E. Priest, M.D.,* Minneapolis, Minnesota 137

Esophageal Hiatus Hernia
R. H. LaBree, M.D., and *J. Muller, M.D.,* Duluth, Minnesota 141

Lymphosarcoma—Unusual Extranodal Primary Manifestations
Cleon R. Holland, M.D., and *Wallace A. Merritt, M.D.,* Rochester, Minnesota 144

Treatment of Severe Injuries of the Hand
Lester W. Carlander, M.D., Minneapolis, Minnesota 149

The Use of Liquid Oxygen in Dermatology
Carl W. Laymon, M.D., and *Charles J. Balogh, M.D.,* Minneapolis, Minnesota 151

Problems in the Clinical Diagnosis and Classification of Ventricular Hypertrophy in Adults
III. Familial Cardiopathy
Ben Sommers, M.D., Saint Paul, Minnesota 153

Trichinosis, a Declining Infection
Franklin G. Wallace, Ph.D., and *Arthur I. Sanders,* Minneapolis, Minnesota 157

Accidental Gunshot Wounds
W. P. Eder, M.D., Minneapolis, Minnesota 159

SPECIAL ARTICLES

Sick People in a Troubled World
Howard A. Rusk, M.D., New York 161

Medicine in Southern Minnesota
David P. Anderson, M.D., Austin, Minnesota 165

CASE PRESENTATION

Henoch-Schoenlein's Purpura
John T. Olive, M.D., and *Chester E. Thiem, M.D.,* Mankato, Minnesota 16

CONTINUATION STUDIES

Infectious and Postinfectious Encephalitis
Paul M. Ellwood, Jr., M.D., Minneapolis, Minnesota 16

CURRENT CONCEPTS

Hypotensive Drugs
Walter F. Kvale, M.D., Rochester, Minnesota 17

LABORATORY AIDS

Is Immunity to Trichinosis Being Naturally Acquired?
John H. Thompson, Jr., Ph.D., Rochester, Minnesota 17

Official Journal of

Duluth Surgical Society
Minneapolis Academy of Medicine
Minneapolis Obstetrical and Gynecological Society
Minneapolis Surgical Society
Minnesota Academy of Medicine
Minnesota Society of Clinical Pathologists

Owner and Publisher

Published by MINNESOTA STATE MEDICAL ASSOCIATION
496 Lowry Medical Arts Building
St. Paul 2, Minnesota

Editing and Publishing Committee

E. M. HAMMES, M.D.
Chairman, Saint Paul

F. M. OWENS, JR., M.D.
Saint Paul

T. A. PEPPARD, M.D.
Minneapolis

HENRY ULRICH, M.D.
Minneapolis

Business Manager

R. R. ROSELL
496 Lowry Medical Arts Building
St. Paul 2, Minnesota

GENERA

Authors

Manuscripts should be addressed to Arthur H. Wells, M.D., Editor, 915 East Fir
Street, Duluth 5, Minnesota. Telephone RA 7-6636 or JA 5-2319. Original papers prepare
for publication solely in MINNESOTA MEDICINE will be considered by the Board of Edito
providing they fulfill the following editorial standards. Manuscripts should be type
double spaced on white paper with at least 1-inch margins. The original (not a carbo
copy) is requested. The title on the first page should be under six words if possib
or divided into two parts. The author should give his highest degree, his institution
position or his relationship to a hospital or medical organization which he may
addressing. Pages should be numbered consecutively and the author's last name shou
appear at the top of each page after the first page.

Biographical references should appear on a separate sheet entitled "Bibliography." Th
should appear and be numbered consecutively in the order in which they first occur
the text (not alphabetically). Citations in the text require reference numbers if t
author's or authors' names are not used or if there is more than one reference to t
same author or group of authors. All references to author should appear in t
Bibliography and no references should be included which are not in the text. The st
and exact punctuation used in the J.A.M.A. references is requested. For a journal this i
*Author's last name, initial, initial.: title of paper. Abbreviated name of journal, volum
number: page, year.* Book references should give author, title, edition number, ci
publisher and year.

Illustrations (photographs, tables and graphs) should be submitted separately and n
combined in the text. There should be a separate sheet entitled "Illustrations" whi
contains the various types of illustrations listed separately and numbered in the ord

Medicine

Number 3

March, 1956

MISCELLANEOUS ARTICLES

DITORIALS

What About Reading? 176
Syphilology 176
Does the Physician Need an Architect? 177
Present Status of Veterinary Medicine 178
Homemaker Service 178
The Changing Pattern of Bank Loans 179
Alcoholism 179

N MEMORIAM

William Frank Maertz 180

RESIDENT'S LETTER

Survey on Nation's Physicians 181

EDICAL ECONOMICS

Iowa Decision Upholds Doctors 182
Colorado and Idaho Decisions 183
President's 1956 Health Message 184

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

Saint Paul Quack Sentenced to Workhouse for One Year 184

THE DEAN'S PAGE

Education for General Practice 185

REPORTS AND ANNOUNCEMENTS 186

WOMAN'S AUXILIARY 188

LETTER TO THE EDITOR 188

GENERAL INTEREST

Personal News A-34
New Locations A-36
Minnesota Blue Cross-Blue Shield A-36

BOOK REVIEWS A-38

CLASSIFIED ADVERTISING A-44

INDEX TO ADVERTISERS A-45

Minnesota Society of Internal Medicine
Minnesota State Medical Association
Minnesota Obstetric and Gynecologic Society
Minnesota Surgical Society
Northern Minnesota Medical Association
Southern Minnesota Medical Association

FORMATION

which they appear in the text. All photographs must be in black and white, clear t, contrasting, and on glossy prints. Instructions for combining photographs are ceptable. Any number of illustrations over 4 are charged to the author. Combinations photographs up to one-half page (6 x 4⅜ inches) count as 1 illustration.

eaders and Reviewers

The right is reserved to reject material submitted for reading or advertising columns. ie views expressed in this journal do not necessarily represent those of the Minnesota ate Medical Association or any of its constituents.

dvertisers and Subscribers

Classified advertising—10 cents a word; minimum charge $2.00; key number, 25c ditional. Remittance should accompany order. Display advertising rates on request.

Annual Subscription—$3.00. Single Copies—$0.40. Foreign and Canadian—$3.50.

Communications concerning advertising and subscriptions should be addressed to INNESOTA MEDICINE, 2642 University Avenue, Saint Paul 14, Minnesota. Telephone Midty 6-2641.

opyright and Post Office Entry

Contents of MINNESOTA MEDICINE ©1956 by Minnesota State Medical Association.

Entered at the Post Office in Saint Paul as second class matter. Accepted for mailing at e special rate of postage provided for in Section 1103, Act of October 3, 1917, thorized July 13, 1918.

Board of Editors

ARTHUR H. WELLS, M.D.
Editor-in-Chief, Duluth

STUART W. ARHELGER, M.D.
Minneapolis

JOHN F. BRIGGS, M.D.
Saint Paul

S. FRANCIS CEPLECHA, M.D.
Redwood Falls

TAGUE C. CHISHOLM, M.D.
Minneapolis

ROBERT B. HOWARD, M.D.
Minneapolis

R. DREW MILLER, M.D.
Rochester

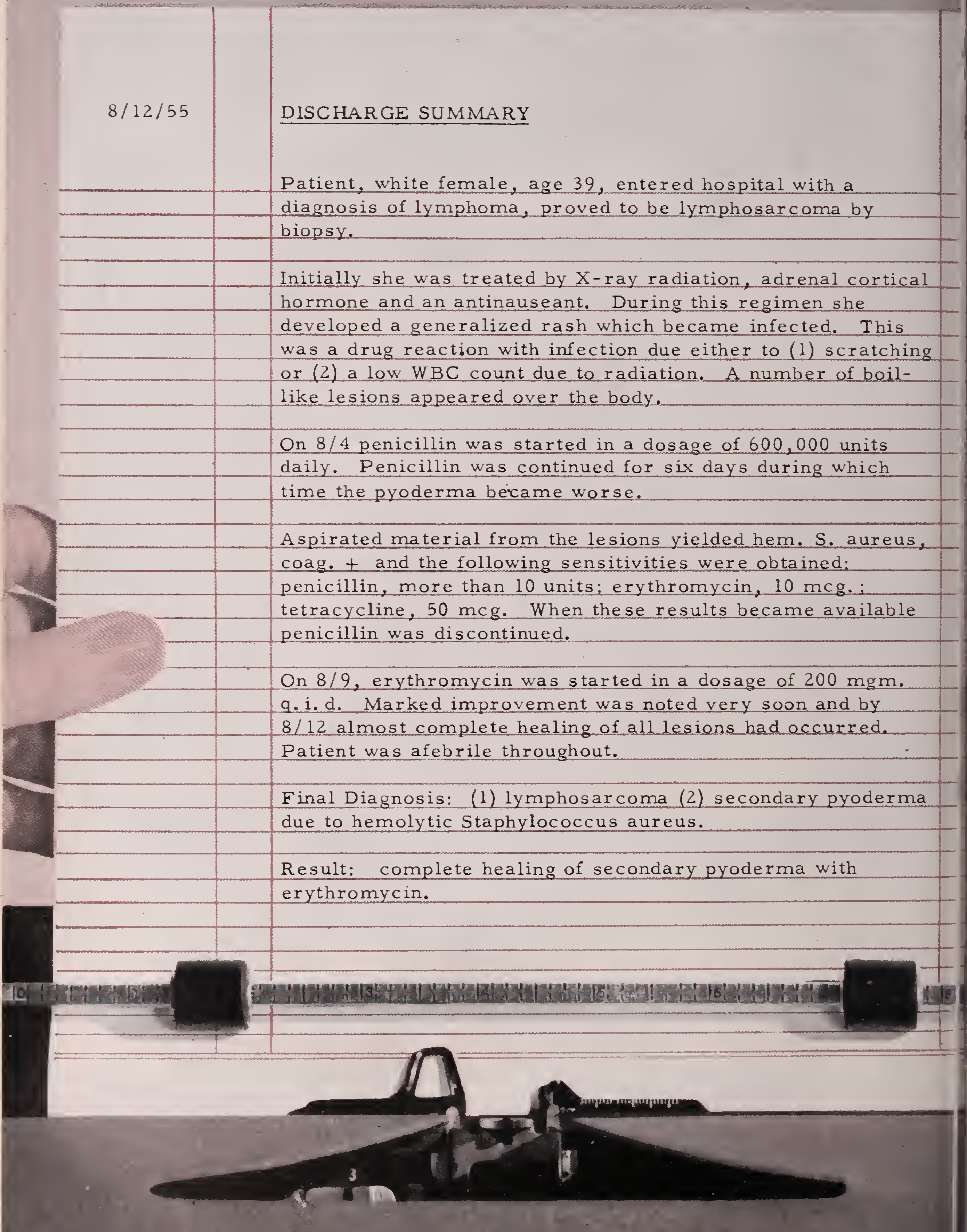
HENRY G. MOEHRING, M.D.
Duluth

GLENN J. MOURITSEN, M.D.
Fergus Falls

OLIVE V. SEIBERT, B.A.
Saint Paul

GEORGE STILWELL, M.D
Rochester

Erythromycin in treatment of pyoderma*



8/12/55

DISCHARGE SUMMARY

Patient, white female, age 39, entered hospital with a diagnosis of lymphoma, proved to be lymphosarcoma by biopsy.

Initially she was treated by X-ray radiation, adrenal cortical hormone and an antinauseant. During this regimen she developed a generalized rash which became infected. This was a drug reaction with infection due either to (1) scratching or (2) a low WBC count due to radiation. A number of boil-like lesions appeared over the body.

On 8/4 penicillin was started in a dosage of 600,000 units daily. Penicillin was continued for six days during which time the pyoderma became worse.

Aspirated material from the lesions yielded hem. S. aureus, coag. + and the following sensitivities were obtained: penicillin, more than 10 units; erythromycin, 10 mcg.; tetracycline, 50 mcg. When these results became available penicillin was discontinued.

On 8/9, erythromycin was started in a dosage of 200 mgm. q. i. d. Marked improvement was noted very soon and by 8/12 almost complete healing of all lesions had occurred. Patient was afebrile throughout.

Final Diagnosis: (1) lymphosarcoma (2) secondary pyoderma due to hemolytic Staphylococcus aureus.

Result: complete healing of secondary pyoderma with erythromycin.

---

*Communication to Abbott Laboratories

pecific against
ccic infections

Now, you can prescribe an antibiotic (*Filmtab* ERYTHROCIN) that provides *specific therapy* against staph-, strep- or pneumococci. Since these organisms cause most bacterial respiratory infections (and since they are the very organisms most sensitive to ERYTHROCIN) doesn't it make good sense to prescribe ERYTHROCIN when the infection is coccic?

filmtab®

Erythrocin®
(Erythromycin, Abbott)
STEARATE

ith little risk of
rious side effects

Since ERYTHROCIN is inactive against gram-negative organisms, it is less likely to alter intestinal flora—with an accompanying low incidence of side effects. Also, your patients seldom get the allergic reactions sometimes seen with penicillin. Or loss of accessory vitamins during ERYTHROCIN therapy. *Filmtab* ERYTHROCIN (100 and 250 mg.), bottles of 25 and 100.

Abbott

filmtab®

Erythrocin®
(Erythromycin, Abbott)
STEARATE

®Filmtab—Film sealed tablets; patent applied for.

Sweet*10 a new cyclamate sweetener for sugar-restricted diets!

NON-NUTRITIVE SWEETENER
6 fluid ounces
Sweet*10
10 TIMES SWEETER
than sugar
To be used in place of sugar. Sweet-10 is a water solution of 17% cyclamate calcium 0.1% Benzoic acid and 0.05% Methylparaben. Should be used only by persons who must restrict their intake of ordinary sweets.

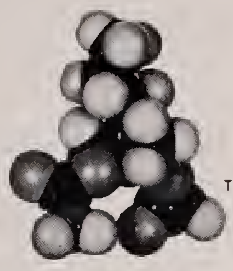
Sweet-10 can help many of your patients. Used in place of sugar, Sweet-10 is valuable in weight control and in low salt and sugar-free diets.

Sweet-10's radio and newspaper promotion will suggest its use with coffee, tea, cereals and fruit or in cooked or baked foods. No calories . . . adds no weight.

Sweet-10's advantages over saccharin-type sweeteners will be stressed. Sweet-10 can be used in cooking, leaves no bitter aftertaste. *More economical than other cyclamate sweeteners.*

Sweet-10 is a water solution of 17% cyclamate calcium, 0.1% Benzoic acid and 0.05% Methylparaben. Also available in powder and tablet forms (cyclamate calcium). Now available in food stores.

Sweet*10 TIDY HOUSE PRODUCTS CO., Shenandoah, Iowa



THE MILTOWN MOLECULE

Two articles in the April 30th issue of The Journal of the AMA[1,2] *report on . . .*

an entirely new type of tranquilizer with muscle relaxant action—orally effective in

ANXIETY, TENSION and MENTAL STRESS

- no autonomic side effects—well tolerated
- selectively affects the thalamus
- not related to reserpine or other tranquilizers
- not habit forming, effective within 30 minutes for a period of 6 hours
- supplied in 400 mg. tablets. Usual dose: 1 or 2 tablets—3 times a day

1. Selling, L. S.: J.A.M.A. **157:** 1594, 1955. **2.** Borrus, J. C.: J.A.M.A. **157:** 1596, 1955.

Miltown®

the original meprobamate—2-methyl-2-n-propyl-1,3-propanediol dicarbamate—U. S. Patent 2,724,720

DISCOVERED AND INTRODUCED by Wallace Laboratories, New Brunswick, N. J.
Literature and Samples Available On Request

What makes Viceroy different from other filter cigarettes?

Only VICEROY— has 20,000 tiny filters in every tip . . . twice as many as the other two largest-selling filter brands! That's why you get that fresh, clean real tobacco taste!

TWICE AS MANY FILTERS

The VICEROY filter tip contains 20,000 tiny filters made exclusively from pure cellulose . . . soft, snow-white, natural. This is twice as many filters as the other two largest-selling filter brands.

That is why VICEROY gives you such a fresh, clean taste—that real tobacco taste you miss in other filter brands. No wonder so many doctors now smoke and recommend King-Size VICEROYS.

If it's Viceroy you can tell the difference blindfolded!

VICEROY
Filter Tip
CIGARETTES
KING-SIZE

King-Size Filter Tip **VICEROY**

let's look at the record

More physicians have successfully treated more patients for more indications over a longer period of time with tablets of

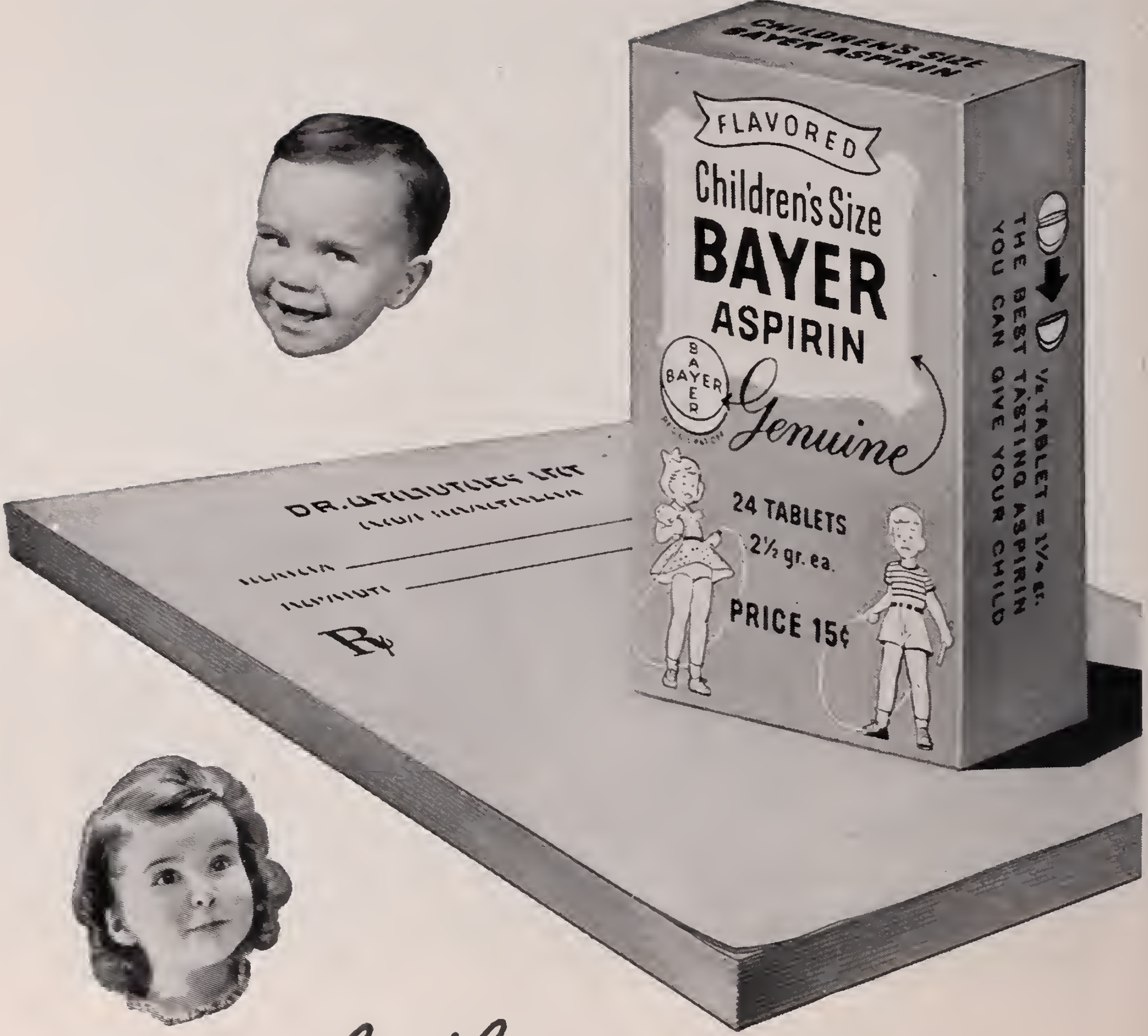
Cortone®
ACETATE
(CORTISONE ACETATE, MERCK)

HydroCortone®
(HYDROCORTISONE, MERCK)

than with any other adrenal cortical steroid.

SHARP & DOHME

Philadelphia 1, Pa.
DIVISION OF MERCK & CO., INC.


CHILDREN'S SIZE BAYER ASPIRIN
FLAVORED
Children's Size
BAYER
ASPIRIN
BAYER
Genuine
24 TABLETS
2½ gr. ea.
PRICE 15¢
½ TABLET = 1¼ gr.
THE BEST TASTING ASPIRIN YOU CAN GIVE YOUR CHILD
DR.
℞

little

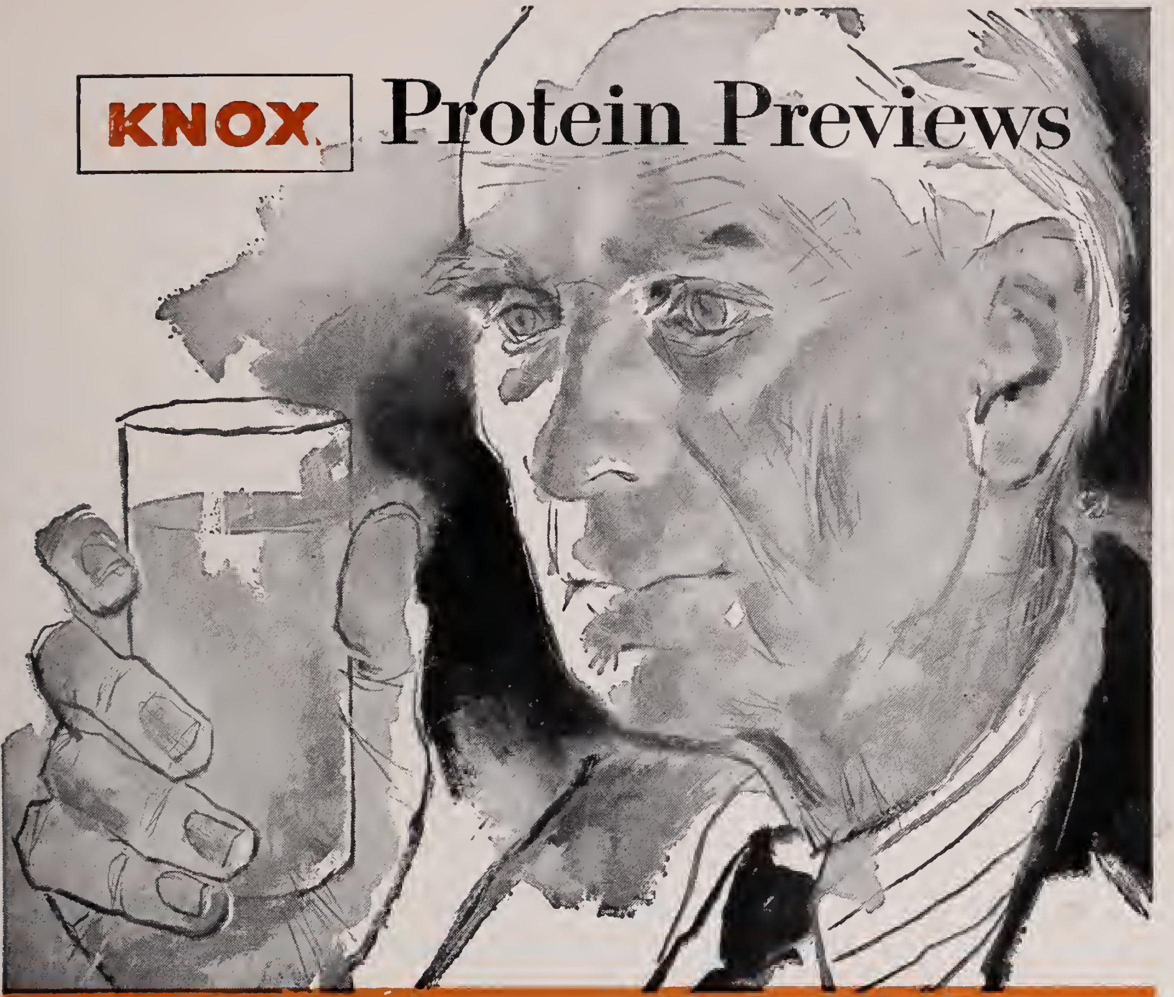
How to win friends . . .

The Best Tasting Aspirin you can prescribe.
The Flavor Remains Stable down to the last tablet.
15¢ Bottle of 24 tablets (2½ grs. each).

We will be pleased to send samples on request.

THE BAYER COMPANY DIVISION
of Sterling Drug Inc.
1450 Broadway, New York 18, N. Y.

KNOX Protein Previews



Maintaining Lean Body Mass in the Edentulous Geriatric Patient

KNOX
32
UNFLAVORED
GELATINE

Extensive loss of body protein can occur in either the spare or obese geriatric patient. But whatever the patient's somatotype, a decrease in lean body mass is usually the result of inadequate protein intake due to poor dentition, slowed-down digestion and quite frequently, unappetizing main dishes.

Knox Gelatine is an excellent non-residue protein which is easy to chew and readily digested and assimilated. As a vehicle for many foods, Knox Gelatine brightens bland diets, giving a new interest to jaded appetites. As a concentrated protein drink, Knox Gelatine supplies seven out of eight essential amino acids and a majority of the other amino acids composing protein.

Specific suggestions on how to use Knox Gelatine in different types of geriatric diets are described in the booklets listed in the coupon below.

Chas. B. Knox Gelatine Company, Inc.
Professional Service Department SJ-15.
Johnstown, N. Y.

Indicate number of special diet booklets desired for your patients opposite title:

GERIATRIC________ REDUCING________
DIABETIC________ CONVALESCENT________

YOUR NAME AND ADDRESS

Get the Facts!!

about the

PROFESSIONAL CREDIT PROTECTIVE BUREAU

The Professional Credit Protective Bureau has proved very beneficial to many professional people who have adopted this excellent credit control and collection service.

We urge you to make use of this service since it will be of great benefit in recovering long delinquent accounts and in eliminating, through proper control measures, the accumulation of slow and bad accounts.

Professional Credit Protective Bureau
701 Metropolitan Bldg., Minneapolis 1, Minn.

YES, I would like to give the PROFESSIONAL CREDIT PROTECTIVE BUREAU a trial. Please ask one of their representatives to call on me without obligation to explain the plan in detail.

NAME ....

ADDRESS ....

You can specify

PABLUM®

with confidence!

As a physician, you appreciate the strictness of pharmaceutical standards. Pablum Cereals are the only baby cereals made by nutritional and pharmaceutical *specialists.* That's why you can specify Pablum Cereals with *confidence.*

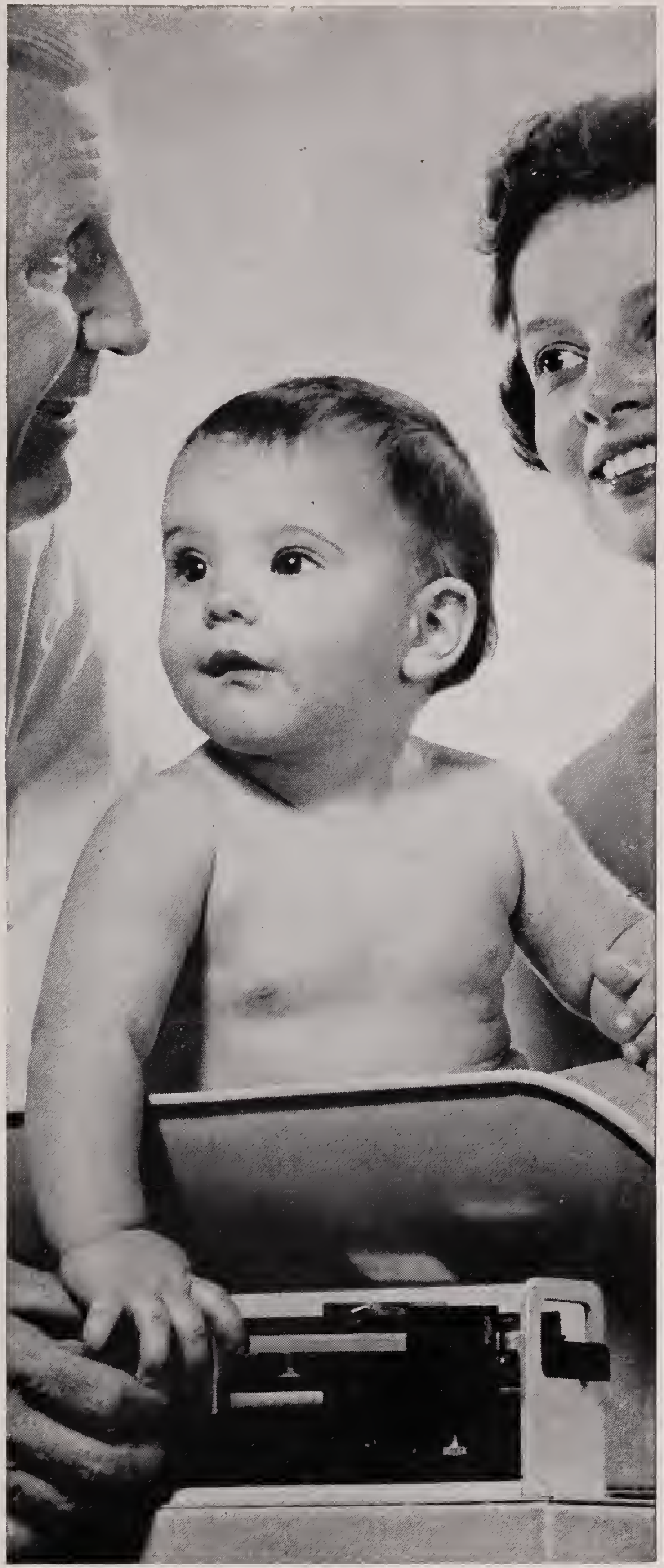
All four Pablum varieties are especially enriched with iron in its most assimilable form. And all are enriched with thiamine, riboflavin, calcium, phosphorus and copper.

To be sure infants *enjoy* Pablum Cereals, our scientists work tirelessly to make them wonderfully smooth in texture, delightfully delicate in flavor. For your young patients, suggest:

Pablum Mixed Cereal
Pablum Barley Cereal
Pablum Rice Cereal
Pablum Oatmeal

Pablum Products

DIVISION OF MEAD JOHNSON & CO., EVANSVILLE, INDIANA
MANUFACTURERS OF NUTRITIONAL AND PHARMACEUTICAL PRODUCTS.



in **acne**
eczemas
dry skin

why not use the most effective vitamin A?

aqueous*
vitamin A is
a superior form
of vitamin A

aquasol A capsules

vitamin A
in high dosage
is effective
in many
hyperkeratotic lesions

*oil soluble vitamin A made water-soluble with sorethytan esters; protected by U.S. Patent No. 2,417,299.

samples and detailed literature upon request

u. s. vitamin corporation
(Arlington-Funk Laboratories, division)
250 East 43rd St., New York 17, N.Y.

better and more rapidly
absorbed and utilized,
better tolerated . . .

clinical evidence establishes
(as shown in chart below) that
aqueous vitamin A, as
available in Aquasol A Capsules,
provides . . .

up to 300% greater absorption
100% higher liver storage
80% less loss through fecal excretion

only **1/2** to **1/10** as much aqueous vitamin A is needed

	aqueous vitamin A**	ordinary oily vitamin A
acne	25,000 to 50,000 units daily	up to 500,000 units daily
eczema chronic	25,000 to 50,000 units daily	50,000 to 500,000 units daily
excessively dry skin	60,000 to 100,000 units daily	100,000 to 300,000 units daily

**Aquasol A Capsules (aqueous natural vitamin A) was one of the products used in these studies.

only **1/2** to **1/3** the treatment time is required for aqueous vitamin A

aquasol A capsules

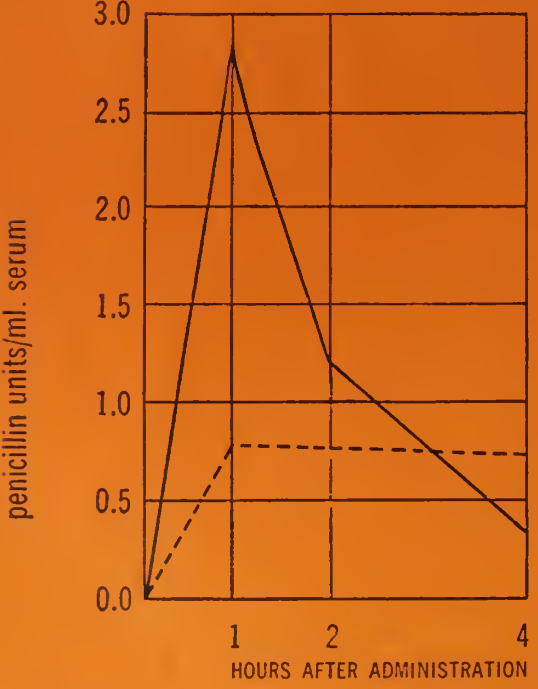
three separate high potencies of natural vitamin A per capsule . . .
in water-soluble form:

25,000 U.S.P. units **50,000 U.S.P. units** **100,000 U.S.P. units**

bottles of 100, 500 and 1000 capsules

ORAL PENICILLIN WITH *INJECTION* PERFORMANCE

Now! A 500,000-unit tablet for higher, faster blood levels than from injected procaine penicillin



Supplied: PEN·VEE·*Oral* Tablets, 500,000 units, scored, bottles of 12; 200,000 units, scored, bottles of 36. Also available: BICILLIN®·VEE Tablets, 100,000 units of benzathine penicillin G and 100,000 units of penicillin V, bottles of 36.

1. Wright, W.W.: Personal communication.
2. Price, A.H.: Personal communication.

PEN·VEE·*Oral**

Penicillin V, Crystalline (Phenoxymethyl Penicillin)

Wyeth
®
Philadelphia 1, Pa.

*Trademark

Why Gantrisin?

... because this single sulfonamide is so soluble -- even in acid urine -- that it is not likely to endanger normal kidney function; because it has a wide antibacterial spectrum; and because it does not, as a rule, cause gastrointestinal upsets or overgrowth of fungi. Patients usually respond so satisfactorily that it has become ...

a sulfonamide of first choice

Gantrisin® - brand of sulfisoxazole

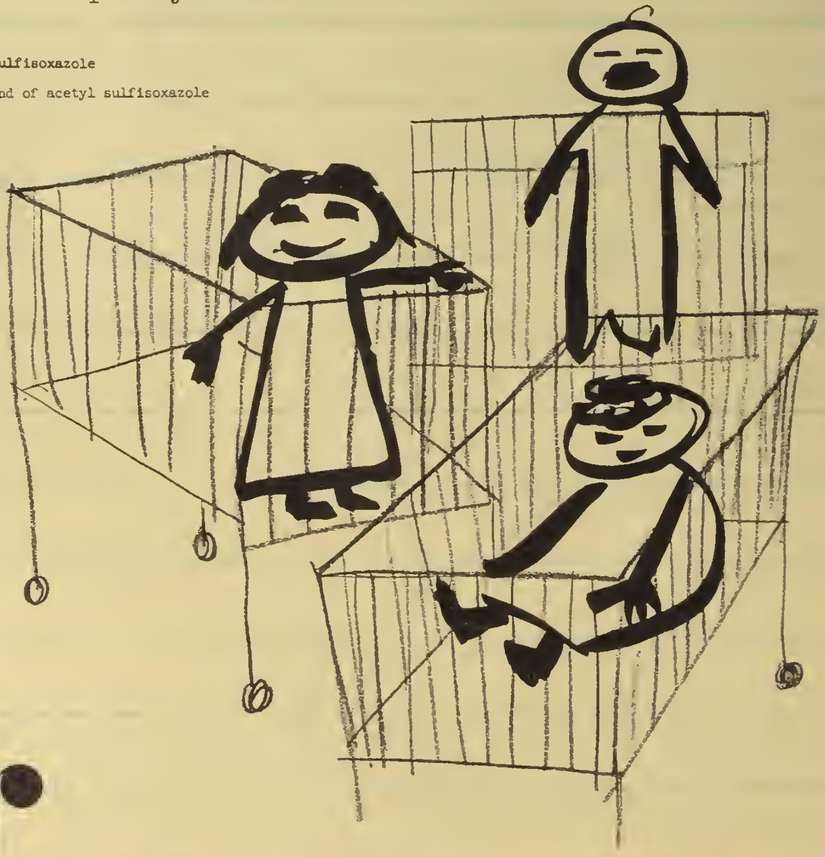
The judge

of an antibacterial is the physician. Your decision will be based on effectiveness and safety. Gantrisin (acetyl) Pediatric Suspension is effective against a wide range of pathogens; because Gantrisin is highly soluble there is little danger of renal damage and no need for alkalies.

The jury

... your younger patients especially ... will render a verdict on taste. Gantrisin (acetyl) Pediatric Suspension is popular with children for its delicious raspberry flavor.

Gantrisin® - brand of sulfisoxazole
Gantrisin® acetyl - brand of acetyl sulfisoxazole



roche

original research in medicine and chemistry

the point is this...

HydroCortone® -TBA

(HYDROCORTISONE TERTIARY-BUTYLACETATE, MERCK)

gives the arthritic patient more days of freedom from joint symptoms—in many patients the anti-rheumatic effect persists 2 to 10 times longer than after injection of hydrocortisone acetate. Its action is local and without systemic effect.

SHARP & DOHME
Philadelphia 1, Pa.
DIVISION OF MERCK & CO., INC.

SUPPLIED: SALINE SUSPENSION HYDROCORTONE-TBA—25 MG./CC., VIALS OF 5 CC.

Meat...

and the Value of Fat in Nutrition

Authorities in the field of nutrition no longer consider fat as an optional component of the diet. Evidence from the laboratory and bedside indicates that fat in small amounts may be looked upon as an obligatory constituent of a health-promoting diet.[1]

The far-reaching value of fat in nutrition has been amply demonstrated in laboratory animals in its pronounced effect on growth, on pregnancy and lactation, on nitrogen-sparing action, on work capacity, on time of sexual maturity, on the period of survival during fasting, and on ability to combat external stresses.[1]

Young animals fed a fat-free diet not only fail to grow normally, but develop hair and skin changes characteristic of "essential" fatty acid deficiency.[2] Fatty acids other than the "essential" fatty acids also appear to be necessary for optimal health. Animals fed "essential" fatty acids but no others do not grow optimally.

The value of fat in human nutrition was emphasized in a recent study[2] comprising 200 patients incapable of receiving adequate nourishment. For periods of 1 to 30 days, these patients were given supplementary fat alimentation by vein in the form of fat emulsion containing "essential" as well as other fatty acids. The result was typically a marked increase in weight and more positive nitrogen and potassium balances.

Meat, recognized for its high content of biologically valuable protein, B vitamins, and essential minerals, provides, in addition, substantial amounts of nutritionally important fat.

---

[1] Deuel, H. J., Jr.: Newer Concepts of the Role of Fats and of the Essential Fatty Acids in the Diet, Food Res. *20*:81 (Jan.-Feb.) 1955.

[2] Meng, H. C.: Preparation, Utilization, and Importance of Neutral Fat Emulsion in Intravenous Alimentation, in Najjar, V. A.: Fat Metabolism, Baltimore, The Johns Hopkins Press, 1954, pp. 69-92.

The nutritional statements in this advertisement have been reviewed by the Council on Foods and Nutrition of the American Medical Association and found consistent with current authoritative medical opinion.

American Meat Institute
Main Office, Chicago . . . Members Throughout the United States

Throughout the world...

use in millions of cases and reports by thousands of physicians have built confidence in TERRAMYCIN®

BRAND OF OXYTETRACYCLINE

...well-tolerated, rapidly effective broad-spectrum antibiotic of choice.

Capsules, tablets, taste-tempting liquid forms and special preparations for parenteral, topical and ophthalmic use.

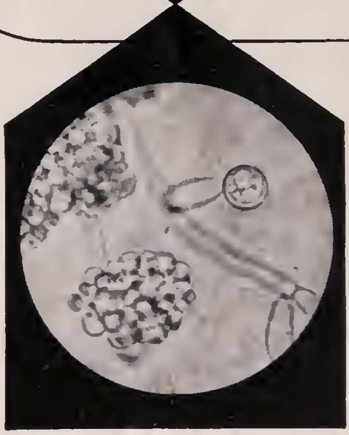
Pfizer

PFIZER LABORATORIES
Division, Chas. Pfizer & Co., Inc.
Brooklyn 6, N. Y.

the only broad spectrum antibiotic preparation that...

1 provides the antimicrobial activity of tetracycline

Because it contains Steclin (Squibb Tetracycline), the well tolerated broad spectrum antibiotic, MYSTECLIN is an effective therapeutic agent for many common infections. Most pathogenic bacteria, as well as certain large viruses, certain Rickettsiae, and certain protozoans, are susceptible to Mysteclin.



2 protects the patient against monilial superinfection

Because it contains Mycostatin (Squibb Nystatin), the first safe antifungal antibiotic, MYSTECLIN acts to prevent monilial overgrowth frequently observed during broad spectrum antibiotic therapy. Manifestations of this overgrowth may include some of the diarrhea and anal pruritus associated with antibiotic therapy, as well as vaginal moniliasis and thrush. On occasion, serious and even fatal infections caused by monilia may occur.

Mysteclin

STECLIN-MYCOSTATIN
(Squibb Tetracycline–Nystatin)

Each MYSTECLIN Capsule contains 250 mg. Steclin (Squibb Tetracycline) Hydrochloride and 250,000 units Mycostatin (Squibb Nystatin).
Minimum adult dose: 1 capsule q.i.d. *Supply:* Bottles of 12 and 100.

SQUIBB

'MYSTECLIN', 'STECLIN' AND 'MYCOSTATIN'® ARE SQUIBB TRADEMARKS

when the
patient
really needs a
diuretic—

HE NEEDS AN ORGANOMERCURIAL

In those patients with borderline or very mild congestive heart failure who can even get along without diuretic therapy, any agent producing minimal or intermittent diuresis may appear to produce benefit.

But when cardiac decompensation—mild, moderate, or severe—is established, dependable and continuously effective diuresis—obtainable only with potent oral organomercurials—is a therapeutic necessity.

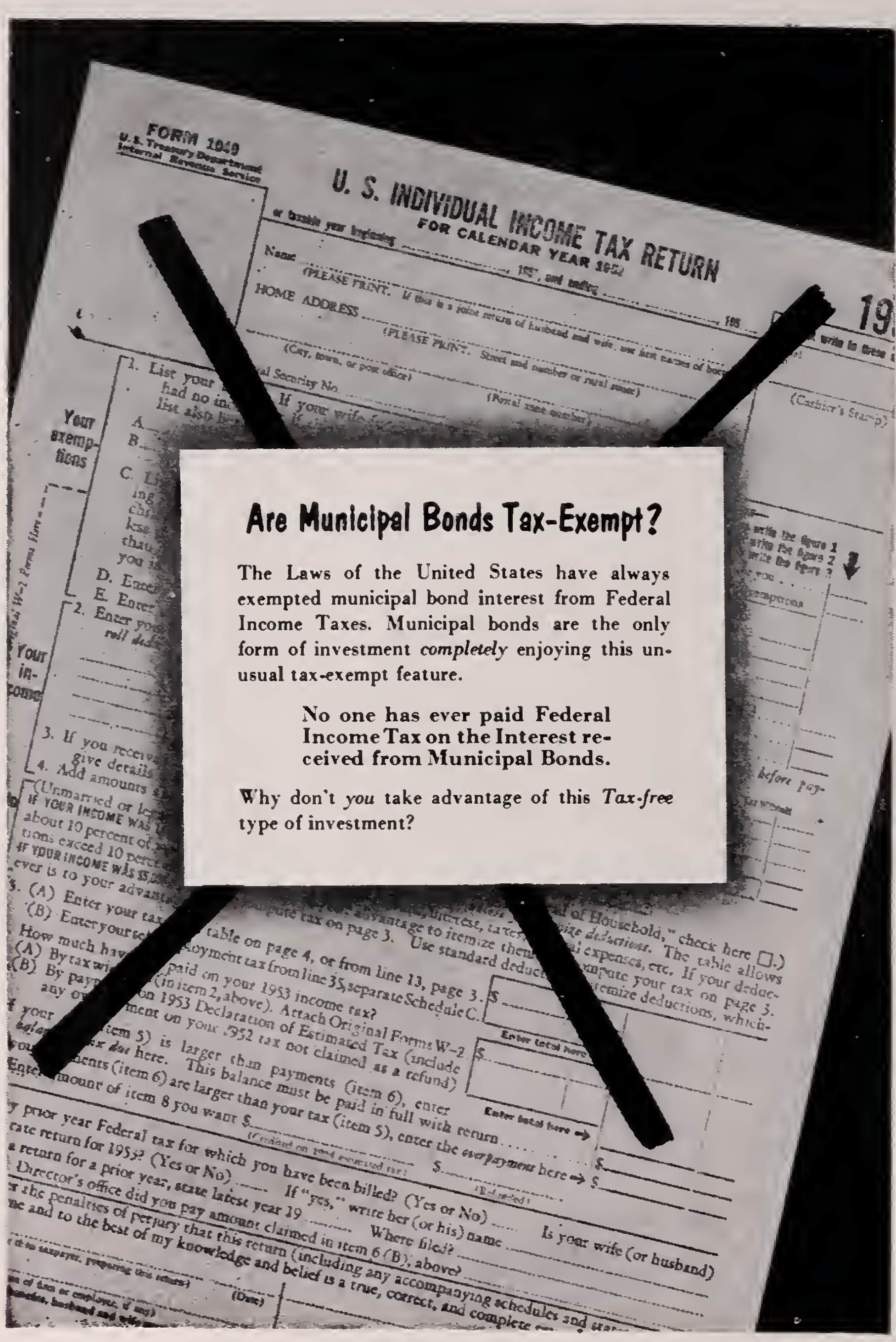
TABLET
NEOHYDRIN®
BRAND OF CHLORMERODRIN (18.3 MG. OF 3-CHLOROMERCURI-2-METHOXY-PROPYLUREA EQUIVALENT TO 10 MG. OF NON-IONIC MERCURY IN EACH TABLET)

a standard for initial control of severe failure

MERCUHYDRIN® SODIUM
BRAND OF MERALLURIDE INJECTION

LAKESIDE

99456



Are Municipal Bonds Tax-Exempt?

The Laws of the United States have always exempted municipal bond interest from Federal Income Taxes. Municipal bonds are the only form of investment *completely* enjoying this unusual tax-exempt feature.

No one has ever paid Federal Income Tax on the Interest received from Municipal Bonds.

Why don't *you* take advantage of this *Tax-free* type of investment?

Reprinted from "Municipal Bonds and You" our colorful sixteen-page book that is available to you Free!

Name____

Address____

City___________________________ State__________

MM-3-6

JURAN & MOODY, INC.

Municipal Bonds Exclusively

Rand Tower
MINNEAPOLIS 2

93 East 6th St.
ST. PAUL 1
TELEPHONE: CApital 4-9661

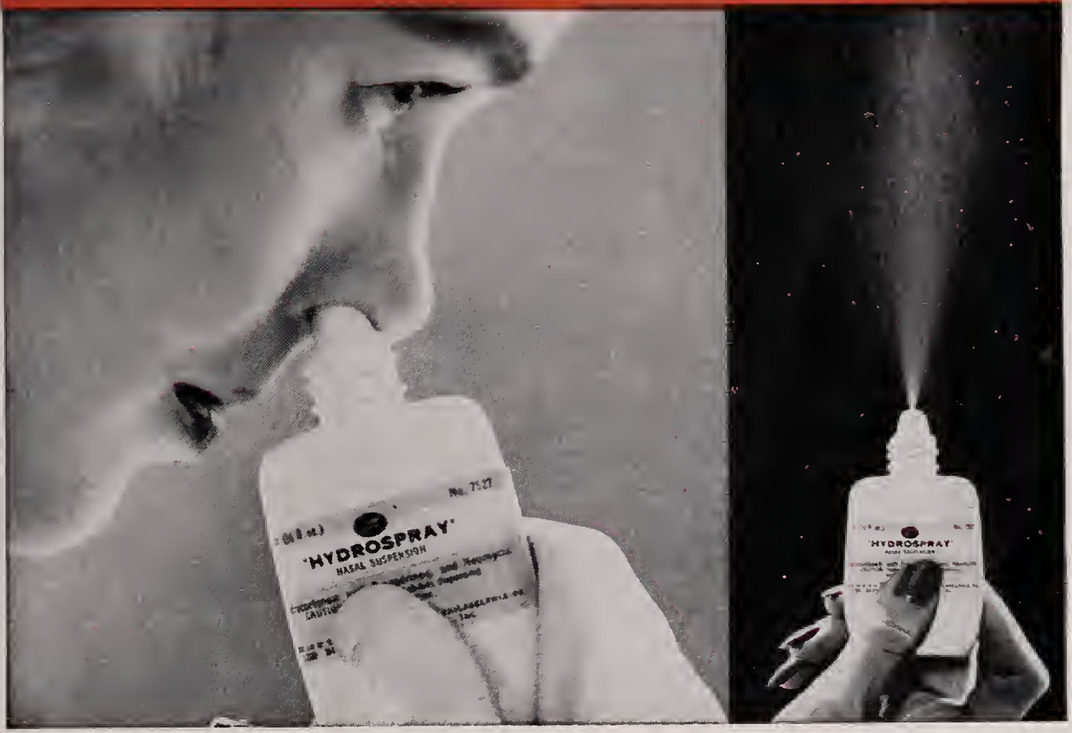
Citizens and Southern Building
ATLANTA, GA.

'Hydrospray' NASAL SUSPENSION

(HYDROCORTONE® WITH PROPADRINE® AND NEOMYCIN)

Anti-inflammatory—
Decongestant—Antibacterial

MAJOR ADVANTAGES: New synergistic anti-inflammatory, decongestant and antibacterial formula. High steroid content assures effective response.

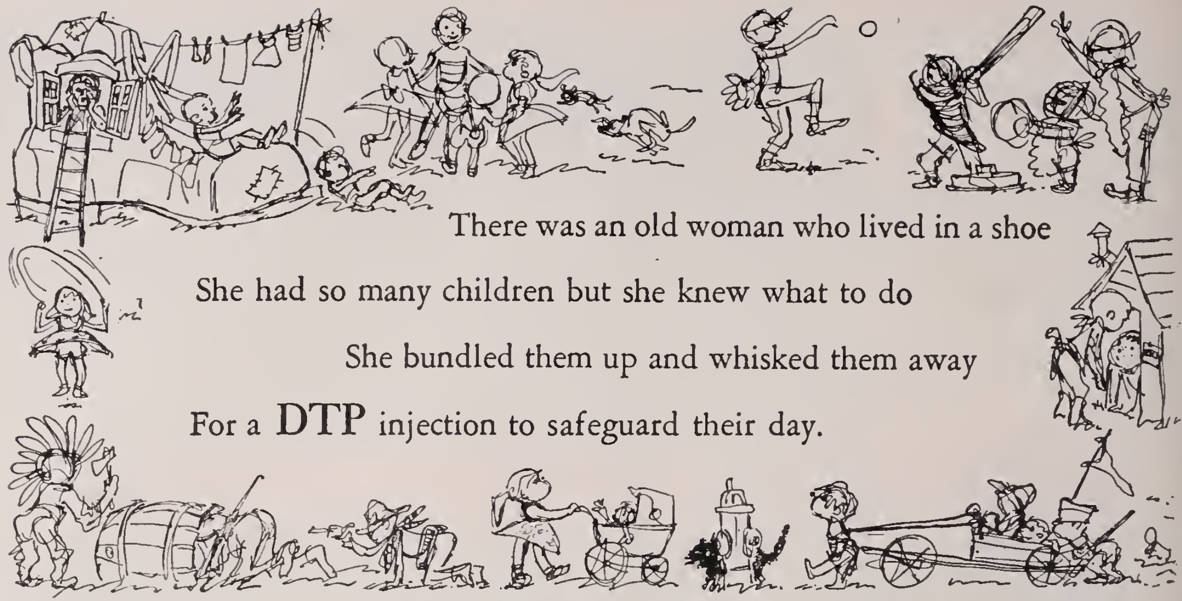


Topically applied hydrocortisone[1] in therapeutic concentrations has been shown to afford a significant degree of subjective and objective improvement in a high percentage of patients suffering from various types of rhinitis. HYDROSPRAY provides HYDROCORTONE in a concentration of 0.1% plus a safe but potent decongestant, PROPADRINE, and a wide-spectrum antibiotic, Neomycin, with low sensitization potential. This combination provides a three-fold attack on the physiologic and pathologic manifestations of nasal allergies which results in a degree of relief that is often greater and achieved faster than when any one of these agents is employed alone.
INDICATIONS: Acute and chronic rhinitis, vasomotor rhinitis, perennial rhinitis and polyposis.

SUPPLIED: In squeezable plastic spray bottles containing 15 cc. HYDROSPRAY, each cc. supplying 1 mg. of HYDROCORTONE, 15 mg. of PROPADRINE Hydrochloride and 5 mg. of Neomycin Sulfate (equivalent to 3.5 mg. of neomycin base).

SHARP & DOHME
Philadelphia 1, Pa.
DIVISION OF MERCK & CO., INC.

REFERENCE: 1. Silcox, L. E., *A.M.A. Arch. Otolaryng.* **60**:431. Oct. 1954.



There was an old woman who lived in a shoe
She had so many children but she knew what to do
She bundled them up and whisked them away
For a DTP injection to safeguard their day.

☆ LEADING PRODUCERS OF BIOLOGICALS ☆

- **One complete immunization**
- **99% of nonspecific protein removed**

DTP

DIPHTHERIA AND TETANUS TOXOIDS AND PERTUSSIS VACCINE COMBINED. Alum Precipitated or Plain.

- **Meets most rigid specifications**
- **Freedom from tissue irritation**
- **Maximum antigenicity with minimum of untoward reactions**

Additional products in The National Drug Company's most complete line of biologicals.

TETANUS ANTITOXIN
INFLUENZA VIRUS VACCINE, POLYVALENT
SMALLPOX VACCINE
GAS GANGRENE ANTITOXIN, TRIVALENT
TETANUS-GAS GANGRENE ANTITOXIN, POLYVALENT

Tetanus Toxoid, Alum Precipitated or Plain. Diphtheria Antitoxin. Diphtheria Toxin for Schick Test. Diphtheria Toxoid, Alum Precipitated or Plain. Diphtheria and Tetanus Toxoids, Alum Precipitated. Pertussis Vaccine, Alum Precipitated or Plain. Rabies Vaccine. Rhus Tox Antigen. Typhoid Vaccine. Typhoid-Paratyphoid Vaccine. Catarrhalis Combined Vaccine for prophylaxis and treatment of the bacterial complications of the common cold. Staphylococcus-Toxoid-Vaccine Vatox. Strepto-Combined Vaccine. Strepto-Staphylo Vatox. Yellow Fever Vaccine.

* * *

Established for Highest Quality

Careful selection and processing of all ingredients under supervision of leading bacteriologists guarantees uniformly high potency, purity and efficacy of each product. Minimum of untoward reactions.

Complete directions, including dosage, route and technique of administration, precautions and contraindications if any, are given in the individual package inserts which accompany each product.

A supply of records of immunizations and tests are available to physicians on request.

PRODUCTS OF ORIGINAL RESEARCH

NATIONAL NATIONAL NATIONAL NATIONAL NATIONAL NATIONAL

THE NATIONAL DRUG COMPANY PHILADELPHIA 44, PA.

Upjohn

Rheumatoid arthritis, rheumatic fever, intractable asthma, allergies . . .

Cortef* *tablets*

Supplied:

5 mg. tablets in bottles of 50
10 mg. tablets in bottles of 25, 100, 500
20 mg. tablets in bottles of 25, 100, 500

*REGISTERED TRADEMARK FOR THE UPJOHN BRAND OF HYDROCORTISONE (COMPOUND F)

The Upjohn Company, Kalamazoo, Michigan

25 Compressed Tablets
Cortef*, 20 mg.
Brand of hydrocortisone
Directions for use—See accompanying insert.
The Upjohn Company
Kalamazoo, Michigan

HELP FOR PROBLEM DRINKERS *

* The Problem Drinker is one whose drinking causes a continuing and growing problem in any department of his life.

IF YOU HAVE PATIENTS IN THIS CATEGORY . . . . INVESTIGATE!

Hazelden is a non-profit organization, designed to help problem drinkers return to normal living. Its peaceful country setting is on beautiful Lake Chisago, near Center City, 45 miles northeast of the Twin Cities, with spacious grounds, suitable and well-equipped buildings. Hazelden is secluded, yet within easy reach of U. S. Highway 8.

Your Inspection Is Invited.
Complete Information on Request.

Director
LYNN CARROLL

Affiliated with St. Croix Memorial Hospital
MEDICAL STAFF
Fred B. Reigel, M.D., *Chief of Staff*
J. C. Belshe, M.D., *Asst. Chief of Staff*
Norwood E. Wegner, M.D.

Hazelden

Twin Cities Office
341 North Dale Street - Saint Paul, Minn.

24 Hour Telephone—CApital 7-6397

for a spastic
GUT

Trasentine®-Phenobarbital

integrated relief ...
mild sedation
visceral spasmolysis
mucosal analgesia

TABLETS *(yellow, coated), each containing 50 mg. Trasentine® hydrochloride (adiphenine hydrochloride CIBA) and 20 mg. phenobarbital.*

C I B A
Summit, N. J.

Re-activate the arthritic

Sterane

MOST POTENT ANTI-RHEUMATIC*

Even where hydrocortisone, cortisone, and other agents had failed, prednisolone (STERANE) restored articular mobility and functional capacity to normal in rheumatoid arthritis.[1]

Four times more effective than hydrocortisone, and, on the basis of preliminary findings,[2,3] superior in potency even to prednisone (cortisone analog), STERANE is also relatively free of such hormonal side effects as edema, hypertension, or hypopotassemia.

Supplied: White, 5 mg. oral tablets, in bottles of 20 and 100. Pink, 1 mg. oral tablets, in bottles of 100. Both are deep-scored and in the distinctive "easy-to-break" size and Pfizer oval shape.

References: 1. Bunim, J. J., et al.: J.A.M.A. 157:311, 1955. 2. Forsham, P. H., et al.: Paper presented at First Internat. Conf. on Prednisone and Prednisolone, New York, May 31-June 1, 1955. 3. Perlman, P. L., and Tolksdorf, S.: Scientific Exhibit presented at A.M.A. Annual Meet., Atlantic City, June 6-11, 1955.

PFIZER LABORATORIES Division, Chas. Pfizer & Co., Inc. Brooklyn 6, New York

*brand of prednisolone

when patients complain of▶

unexcelled relief in nonspeci

NEW SIGM

best of the old	Acetylsalicylic acid . .	325 m
potentiated by the best of the new . . .	METICORTEN	0.75 m
augmented by	Ascorbic acid	20 m
plus	Aluminum hydroxide .	75 m

METICORTEN (prednisone), new Schering corticosteroid, has three to fi times the therapeutic effectiveness, milligram for milligram, of oral cort sone or hydrocortisone. Combined in SIGMAGEN with aspirin and ascorbi acid, it permits unexcelled maintenance of "rheumatic" relief at minim dosages.

Schering

eck • backache • charleyhorse • rheumatics

lumbago • glass arm • devil's grip • bursitis

is elbow • trigger finger • sciatica • neuralgia

umatic disorders

AGEN
TABLETS

icated in

scular rheumatism • mild rheumatoid arthritis • myalgia

ld spondylitis • fibrositis • myositis • subacute gout

leurodynia • tenosynovitis • panniculitis • frozen-shoulder

kaging

es of 100 and 1000.

AGEN.*brand of corticoid-analgesic compound.
ICORTEN.*brand of prednisone.

fastest and shortest-acting oral barbiturate

'Seconal Sodium'

(SECOBARBITAL SODIUM, LILLY)

Lilly
QUALITY / RESEARCH / INTEGRITY

The secret of sleep in a capsule

When simple insomnia is the presenting complaint, a bedtime dose of 'Seconal Sodium' is often indicated. Its effect is prompt—within fifteen to thirty minutes; relaxation and sleep follow quickly. Your patient awakens refreshed and well rested.

Available in 1/2, 3/4, and 1 1/2-grain pulvules at pharmacies everywhere.

622004

ELI LILLY AND COMPANY • INDIANAPOLIS 6, INDIANA, U.S.A.

Original Contributions

The Importance of the Pulmonary Nodule

DONALD L. PAULSON, M.D.
Dallas, Texas

THE importance of the pulmonary nodule has begun to be appreciated only recently in spite of numerous papers which have been published on the subject since 1936. The frequency with which pulmonary nodules are discovered is in direct proportion to the use of routine roentgenograms of the chest. In recent years an active interest in the significance of the pulmonary nodule has been stimulated by an increasing frequency of discovery of these lesions, the realization of their malignant possibilities in a high percentage of cases, and advances in anesthetic and thoracic surgical techniques.

The term pulmonary nodule as used here refers to a single nodular lesion within the lung substance, usually less than 6 cm. in diameter, and surrounded by normal appearing lung tissue on all sides. Hilar, mediastinal, chest wall, and superior sulcus masses are excluded, as are the extremely small or large masses, all of which present a different problem. A pulmonary nodule may or may not produce symptoms. It need not be of homogenous density and may contain calcium. In a broad sense its shape is roughly round or oval, but its border may be notched or nodular, and is not always sharply circumscribed. These nodules have been referred to as coin lesions, solitary round lesions, solitary circumscribed lesions, solitary intrapulmonary tumors, isolated intrathoracic nodules, and single circumscribed intrathoracic densities. There are objections to all of these terms, as pointed out by Sharp and Kinsella[1] and by Fink[2] on the basis of inaccuracy of description. The term pulmonary nodule as herein defined is believed to be more appropriate, as it is a simple anatomic description of a single pulmonary lesion usually of undetermined etiology clinically.

Although Graham and Singer[3] as long ago as 1936 and Alexander[4] in 1942 advocated thoracotomy as the only reliable means of establishing a diagnosis for a circumscribed pulmonary lesion, there are those who do not appreciate the reasons therefor and mistakenly believe that these lesions are usually benign. That this view is still widely prevalent in the medical profession is the stimulus for this paper. Only by careful study of the material available and the widespread dissemination of the results will erroneous beliefs be disavowed. Those skilled in the treatment of chest diseases are in almost complete agreement on the need for prompt exploratory thoracotomy as a diagnostic as well as a therapeutic procedure for the indeterminate pulmonary nodule. That there is not such universal agreement among the general medical profession and the lay public constitutes a challenge of education for those of us well versed in diseases of the chest.

Review of the Literature

From a review of the literature it becomes clear that although the incidence of malignancy varies in individual reported series of pulmonary nodules from 7 per cent to 55 per cent, a significant number are cancers. The average incidence of malignancy for 897 cases is 36 per cent (Table I). It is important to realize that no one series is comparable to another because each series is selective on the basis of age, symptoms, size of the lesion, and the source of patients.

The reports of Jones and Cleve,[5] Effler, Blades and Marks,[6] Grow, Bradford and Mahon,[7] and Storey, Grant and Rothman[8] dealt in the main with young healthy adult males on active duty in the Armed Forces. Yet the incidence of malignancy ranged from 7 to 24 per cent. The patients in the series of Davis and Klepser,[10] O'Brien, Tuttle and Ferkaney,[12] Harrington,[15] Hood, Good, Clagett

---

Dr. Paulson is Clinical Associate Professor of Surgery, Texas University Southwestern Medical School, Dallas, Texas. Twentieth John W. Bell Lecture, May 2, 1955, Minneapolis, Minnesota.

TABLE I. INCIDENCE OF MALIGNANCY IN VARIOUS REPORTED SERIES OF PULMONARY NODULES

AUTHOR	NUMBER OF PATIENTS	NUMBER MALIGNANT	PERCENT MALIGNANT
Jones and Cleve, 1954	14	1	7.0
Effler, Blades and Marks, 1949	24	4	16.6
Grow, Bradford and Mahon, 1948	86	21	24.0
Storey, Grant and Rothman, 1953	40	7	17.5
Husfeldt and Carlson, 1950	33	7	21.2
Davis and Klepser, 1950	67	37	55.0
Davis, Katz and Peabody, 1955	67	34	51.0
O'Brien, Tuttle and Ferkaney, 1948	21	9	42.9
Sharp and Kinsella, 1950	55	15	27.3
Fink, 1951	30	10	33.3
Effler, 1951	16	7	44.0
Abeles and Ehrlich, 1951	31	13	42.0
Harrington, 1951	16	7	43.8
Wolpaw, 1952	25	10	40.0
Hood, Good, Clagett and McDonald, 1953	156	55	35.3
May, Rose and Ougan, 1954	36	8	22.0
Paulson and Shaw, 1955	180	78	43.0
TOTAL	897	323	36.0

and McDonald[17] were unselected with respect to age, and the incidence of cancer varied from 35 to 55 per cent.

The presence of symptoms has a definite effect on the incidence of malignancy. Some authors include only asymptomatic lesions and others all types of lesions regardless of symptoms. In the latter group, notably the reports of Davis and Klepser.[10] and O'Brien, Tuttle and Ferkany,[12] the cancer rates were higher, 55 per cent to 42.9 per cent, respectively. Symptoms were present in 76 per cent of the patients with a malignant tumor and in 23 per cent of those in whom the mass proved to be benign in Davis and Klepser's series.

The size of the lesion is also a selective factor. Sharp and Kinsella[1] limited their study to pulmonary nodules 1 to 4 centimeters in diameter and found malignancy in 27 per cent. It is obvious that larger pulmonary masses are more apt to be malignant. Thornton, Adams and Bloch[19] found an incidence of malignancy of 78.3 per cent of twenty-three patients having huge pulmonary masses.

The source of patients will have a natural selective effect in any series of pulmonary nodules. Reports emanating from facilities devoted particularly to the treatment of pulmonary tuberculosis would be expected to include a higher percentage of granulomas and consequently a lower incidence of cancer. Similarly, a thoracic surgeon reporting only his surgically proven lesions will find his series weighted in favor of carcinoma, because patients referred to him for surgery frequently will be those in whom cancer is suspected.

Material and Method of Study

The present series include 180 patients having pulmonary nodules seen by my associate, Dr. Robert R. Shaw, and me in the private practice of thoracic surgery from 1945 to 1955, a period of ten years. All patients seen by us meeting the definition of a pulmonary nodule were included regardless of age, symptomatology, or whether surgically proven or not. All factors of selectivity are interlinked, and the exclusion of an asymptomatic granuloma in a younger person because it is not surgically proven weights the series in favor of malignancy. It is for this reason that the surgically unproven as well as those proven by operation are included.

Of the total number of 180 patients with pulmonary nodules, 143 or 80 per cent were operated upon and the diagnosis proven pathologically. The remaining thirty-seven patients were not operated upon because surgery was contraindicated or refused or because a reliable diagnosis could be made on clinical grounds alone.

TABLE II. CLASSIFICATION OF 180 CONSECUTIVE PULMONARY NODULES

TYPE OF NODULE	NUMBER	PERCENT OF TOTAL	NUMBER	PERCENT OF TOTAL
I. Malignant			78	43
Bronchogenic carcinoma	62	34		
Metastatic nodule	7	4		
Bronchial adenoma	9	5		
II. Benign Tumors			10	6
Hamartoma	5	3		
Mesothelioma	5	3		
III Inflammatory			74	41
Granuloma	67	37		
Tuberculoma (24)				
Coccidioidal (12)				
Etiology unknown (31)				
(Unproven 19 or 11 percent)				
Pneumonitis, abscess, cyst	7	4		
IV. Miscellaneous			5	3
V Unclassified			13	7
TOTAL			180	100

The pulmonary nodule could be classified on a clinical and roentgenographic basis in our opinion in the case of twenty-four patients or 13 per cent of the total number. Five of these patients presented incontrovertible evidence of malignancy either on first examination or as a result of evidence gained later. The lesions could not be classified in the remaining thirteen patients or 7 per cent of the total. These were patients in whom surgery was contraindicated or refused and sufficient clinical or roentgenographic evidence was present to warrant classification on this basis.

Results

The results of classification of 180 consecutive pulmonary nodules are tabulated in Table II.

TABLE III. DISTRIBUTION OF 180 PULMONARY NODULES ACCORDING TO AGE AND SEX OF THE PATIENTS

TYPE OF NODULE	TOTAL	MEN	WOMEN	1-30	31-40	41-50	51-60	61-70	71-80	81-90	RANGE
Tumors											
Hamartoma	5	3	2	0	0	3	0	2	0	0	41-65
Mesothelioma	5	2	3	1	0	1	3	0	0	0	20-51
Bronchial Adenoma	9	0	9	0	2	3	3	1	0	0	32-64
Bronchogenic Carcinoma	62	48	14	0	3	18	21	19	3	0	36-79
Metastatic Nodule	7	3	4	1	1	2	0	3	0	0	6-64
Inflammatory											
Granuloma	67	40	27	9	20	13	17	8	0	0	23-66
Pneumonitis, Abscess, Cyst	7	2	5	0	0	4	2	1	0	0	43-68
Miscellaneous	5	3	2	0	0	4	1	0	0	0	41-55
Unclassified	13	5	8	1	3	3	3	2	0	1	15-81
TOTAL	180	106	74	12	29	49	50	36	3	1	

It is significant that seventy-eight patients had a malignant nodule, an incidence of malignancy of 43 per cent. There were sixty-two bronchogenic carcinomas or 34 per cent, seven metastatic nodules or 4 per cent, and nine bronchial adenomas or 5 per cent of the total. Only ten patients or 6 per cent of the total 180 patients had true benign tumors.

An inflammatory nodule was present in seventy-four patients or 41 per cent of the total. Of these, sixty-seven or 37 per cent of the total were classified as granulomas. There were twenty-four tuberculomas, twelve coccidioidal granulomas, and thirty-one of undetermined etiology. Nineteen of the thirty-one nodules classified as granulomas of undetermined etiology were not proven pathologically. The age of the patient and the roentgenographic appearance of lamination, the presence of calcification, or surrounding halo justified this classification and surgery was unnecessary for corroboration.

Pneumonitis, abscess, or filled in cyst accounted for the pulmonary nodule in seven patients or 4 per cent of the total.

Miscellaneous lesions, including arteriovenous fistula, pulmonary infarction, pleural fibrosis, actinomycosis, and Hodgkins disease, accounted for five pulmonary nodules or 3 per cent of the total.

Thirteen pulmonary nodules or 7 per cent of the total could not be classified.

The age and sex distribution of the 180 patients is given in Table III. There were 106 men and seventy-four women. Men predominated over women in both the groups of bronchogenic carcinoma and granuloma. Women predominated over men in the groups of bronchial adenoma, pneumonitis, abscess, and cyst and the unclassified group. Men and women were about evenly divided in the benign tumor, metastatic nodule, and miscellaneous group.

The ages of these 180 patients ranged from six to eighty-one years. The six-year-old patient was a girl who has survived and is well eight years following the removal of a metastatic nodule secondary to a Wilm's tumor of the kidney. The age distribution of the bronchogenic carcinoma group was from thirty-six to seventy-nine years, predominating in the fifth, sixth and seventh decades. The thirty-six-year-old patient was a woman whose pulmonary nodule was due to an adenocarcinoma which was watched and treated with streptomycin for ten months because she had some healed scars in the contralateral lung. There were no bronchogenic carcinomas below the age of thirty-five years.

The age distribution of the granuloma group varied from twenty-three to sixty-six years, the larger groups being in the fourth, fifth and sixth decades but extending into the third and seventh decades.

The remaining groups were small and evenly distributed as to age.

The incidence of malignancy increases from 43 per cent in the fifth decade to 64 per cent in the seventh decade. Seven malignant nodules were found in 41 patients under the age of forty years, an incidence of 17 per cent. The age of

TABLE IV. SURGICAL PROCEDURES DONE FOR 144 PULMONARY NODULES

TYPE OF NODULE	SEGMENTAL RESECTION	LOBECTOMY	PNEUMONECTOMY	EXPLORATORY THORACOTOMY
Malignant				
Bronchogenic carcinoma	6	39	12	2
Metastatic malignancy	1	4	1	
Adenoma	2	8		
Benign				
Hamartoma	4	1		
Mesothelioma	4	1		
	17	53	13	2
Inflammatory				
Pneumonitis, abscess, cyst	3	3		
Tuberculoma	21	3		
Granuloma, etiology unknown	12	0		
Coccidioidomycosis	8	4		
	44	10		
Miscellaneous				
Arteriovenous fistula	0	1		
Pulmonary infarction	1	0		
Pleural fibrosis	1	0		
Actinomycosis	0	1		
Hodgkins disease	0	1		
	2	3		
TOTAL	63	66	13	2

thirty-five years seems to be a more reasonable dividing line as far as bronchogenic carcinoma is concerned because none of these occurred below this age. The occurrence of bronchogenic carcinoma in a pulmonary nodule below the age of thirty-five years is possible but very rare. Other malignant nodules, a bronchial adenoma and metastatic nodules, occurred in three patients below the age of thirty-five years.

Statistically the granulomas predominate below the age of thirty-five years, but may be found in any age group even in the seventh decade.

Symptoms of pain, hemoptysis, cough or fever were present in forty-one of sixty-two patients having bronchogenic carcinoma or 69 per cent, and twenty-seven of sixty-seven patients in the granuloma group or 40 per cent. Four of the patients in the granuloma group had hemoptysis.

Inasmuch as symptoms were not present in 30 per cent of the patients with bronchogenic carcinoma, an asymptomatic lesion cannot even be remotely considered as benign. As a matter of fact, much of the early detection and the improvement of the results of surgical removal of carcinoma depend on finding the malignant nodule in an early silent phase.

One hundred forty-four operative procedures were done for 180 pulmonary nodules. There was no surgical mortality. Careful attention to the principal of preservation of lung tissue is evidenced by the fact that segmental resection was possible in sixty-three patients, including six with bronchogenic carcinoma, one with a metastatic nodule, and two with bronchial adenoma. Eight of the ten benign tumors were removed by segmental resection, as were forty-four of the fifty-four inflammatory lesions, including all but seven of the granuloma group. Lobectomy was necessary for fifty-three of the malignant tumors and ten of the inflammatory group. Thirteen pneumonectomies and two exploratory thoracotomies were done, all in the group of malignant nodules (Table IV).

TABLE V. SURVIVAL FOLLOWING RESECTION OF 37 SYMPTOMATIC PULMONARY NODULES DUE TO BRONCHOGENIC CARCINOMA

PERIOD SINCE RESECTION	NUMBER OF RESECTIONS	NUMBER ALIVE	PERCENT SURVIVING
Less than 1 year	13	12	82
1 year	9	6	
2 years	2	2	40
3 years	3	0	
4 years	4	1	
5 years or more	6	3	
TOTAL	37	24	65

Justifiable criticism was made recently by Hodgson[20] of the lack of follow-up studies concerning patients with malignant pulmonary nodules for which resection had been performed. The data to date concerning the survival rates of fifty-six patients whose bronchogenic carcinoma presenting as a pulmonary nodule was resected are presented in Tables V and VI. The patients were divided according to the presence or absence of symptoms because theoretically the latter group should have a better survival rate.

Resections were done in thirty-seven patients in the group of pulmonary nodules due to bronchogenic carcinoma with symptoms. There were no hospital mortalities. Twenty-four of the thirty-seven patients or 65 per cent have survived. Six of the fifteen patients whose carcinoma was resected over two years ago are alive, a survival rate of 40 per cent for this period. Three of the six patients whose carcinoma was resected over five years ago are alive five, six and ten years, respectively.

Resections were done in nineteen patients hav ng a pulmonary nodule caused by bronchogenic arcinoma without symptoms. There were no urgical mortalities. Fifteen or 80 per cent of hese nineteen patients have survived. Seven of the en patients whose resection was done two or more ears ago are alive, a survival rate of 70 per cent or this period.

The combination of the results of resection for oth the symptomatic and asymptomatic group of ulmonary nodules due to bronchogenic carcinoma reveals thirteen or twenty-five patients alive r a 50 per cent survival rate for resections done ver two years ago (Table VII). Enough time has not elapsed to evaluate five-year survival rates in a significant number of patients. Six of fourteen patients operated upon four or more years ago are alive, a survival rate of 43 per cent for this period.

TABLE VI. SURVIVAL FOLLOWING RESECTION OF 19 ASYMPTOMATIC PULMONARY NODULES DUE TO BRONCHOGENIC CARCINOMA

PERIOD SINCE RESECTION	NUMBER OF RESECTIONS	NUMBER ALIVE	PERCENT SURVIVING
Less than I year	7	6	90
I year	2	2	
2 years	5	4	70
3 years	I	I	
4 years	3	2	
5 years or more	I	0	
TOTAL	19	15	79

It would appear from the statistics available that resection for the malignant nodule due to bronchogenic carcinoma yields a satisfactory survival for periods over two years at least.

Discussion

The importance of the pulmonary nodule lies in the fact that a high percentage of these lesions are malignant, in this series 43 per cent. The surgical mortality for resection of the pulmonary nodule is very low, and the results of resection for those nodules due to bronchogenic carcinoma indicate a satisfactory long-term survival rate. The general policy of prompt exploratory thoracotomy for diagnosis as well as the treatment of an indeterminate pulmonary nodule is on a sound basis. The burden of proof in the individual case is on the shoulders of the person who says a particular lesion is benign and does not require surgical removal for diagnosis and treatment.

TABLE VII. SURVIVAL RATE FOR THE ENTIRE GROUP OF PULMONARY NODULES DUE TO BRONCHOGENIC CARCINOMA WITH OR WITHOUT SYMPTOMS

PERIOD SINCE RESECTION	NUMBER OF PATIENTS	NUMBER ALIVE	PERCENT SURVIVING
Less than I year	20	18	84
I year	11	8	
2 years	7	6	50
3 years	4	I	
4 years	7	3	
5 years or more	7	3	
TOTAL	56	39	70

There is good reason for further attempts to outline diagnostic criteria which may be used justifiably to delineate the individual problem. In general, the age of the patient and certain roentgenographic and laboratory information may be of assistance.

Age

In this series of pulmonary nodules there were only three malignant nodules in persons below the age of thirty-five, two metastatic nodules and one adenoma. There were no bronchogenic carcinomas in persons under thirty-five. In this same age group there were sixteen granulomas. It would appear safe to say that below the age of thirty-five years a pulmonary nodule has an overwhelming chance of being a granuloma, and that if it is malignant, it will be metastatic or an adenoma. Bronchogenic carcinoma begins to appear in the age from thirty-five to forty years and beyond this age the incidence of malignancy increases from 43 per cent in the fifth decade to 64 per cent in the seventh decade.

Roentgenographic Criteria

The size and density of the lesion may be of significance, relatively speaking. Vivas and Crabtree[21] found that lesions of medium and small size of light density should be considered malignant (Fig. 1), that lesions of medium and small size of medium density should be studied carefully, and that lesions of heavy density are not likely to be malignant. The larger lesions are more likely to be malignant, although mesotheliomas and hamartomas may attain large size before being found (Fig. 2).

Rigler[22] has called attention to a new sign of malignancy of the pulmonary nodule, consisting of notching or umbilication of a border of the shadow (Fig. 3). It would appear that this sign is of relative value, being significant by its presence but not by its absence. It may be produced by other lesions, particularly by a coccidioidal glanuloma.

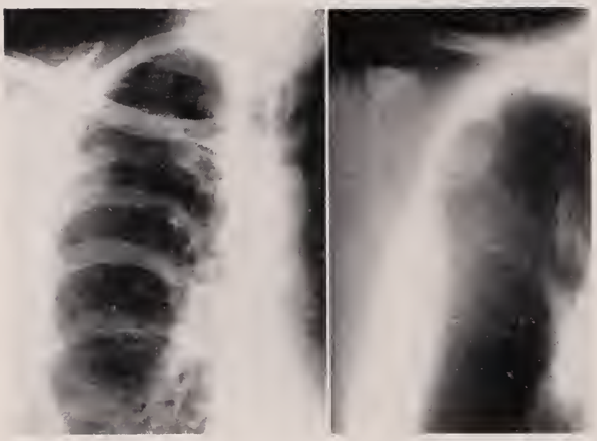


Fig. 1. Pulmonary nodule of medium size and light density in the right lung. Plain roentgenogram and planigram. Proven bronchogenic carcinoma.

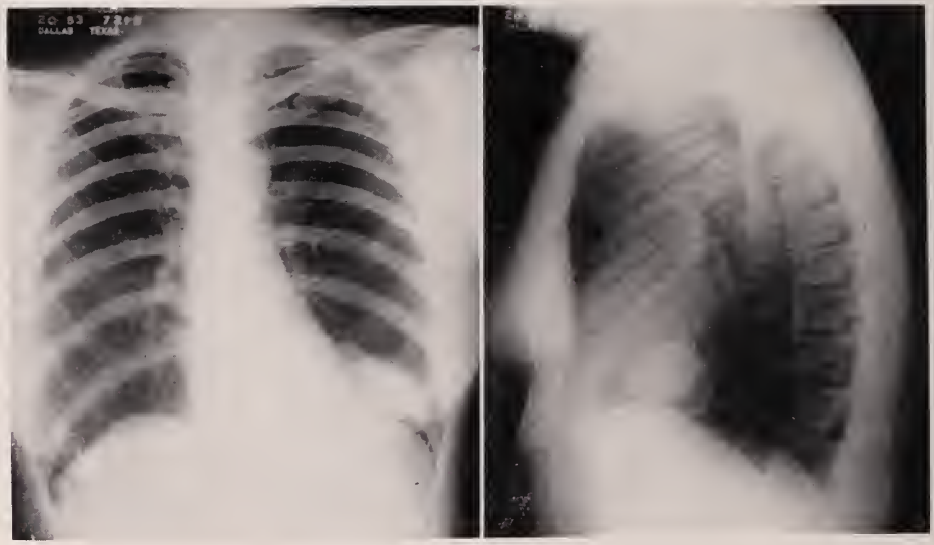


Fig. 2. Mesothelioma, aysmptomatic, found on roentgenogram made in survey.

Lamination, calcification or a surrounding halo all are in favor of the diagnosis of a granuloma or a benign lesion. Planigraphic films are necessary for proper evaluation and one must be sure that what is seen in the roentgenogram is truly calcium and that it does lie in the mass (Fig. 4). Bloch[23] has shown that the degree of calcification in the roentgenogram is arbitrary and dependent on special techniques for demonstration. The Mayo Clinic group[17] found calcification by planigraphic techniques in the benign nodules only. On the other hand, Tuttle,[24] May, Rose and Dugan,[18] and Hodes[25] report several cases in which nodules containing calcium proved to be malignant. We have seen a similar patient in whom surgery was deferred because of apparent calcification within a pulmonary nodule, to be embarrassed by return of the patient at a later date with cerebral metastases from the adenocarcinoma responsible for the nodule. It would appear that the presence of calcium favors benignancy but at best is a relative criterion and is not sufficient evidence alone to prevent the patient from having the benefits of removal of the lesion and histologic examination.

From a diagnostic standpoint, the presence of calcium on roentgenographic examination does not warrant unlimited assurance. Some lesions, such as granulomas, with a high calcium content may be soft and caseous and therefore capable of progression and spread. Multiple areas of rarification within a granulomatous process may represent areas of activity and thus contraindicate delay. Calcification should probably be considered safe only if it occurs in a solid, uniform manner.

Previous chest films may be of importance in demonstrating the lesion to be of long standing and hence less likely to be malignant. However, several cases of malignant nodules are on record that have been present unchanged for a period of years.

Limitations of Laboratory Procedures

Many laboratory procedures are available for the study of pulmonary nodules, but availability alone does not justify prolonged and expensive preoperative examinations of the patient. The peripheral location of the pulmonary nodule makes most important available diagnostic aids ineffective.

Bronchoscopy is seldom indicated or justified in a patient with a pulmonary nodule unless he has symptoms suggestive of an associated bronchial lesion. Cytologic examination of the sputum or bronchial secretions for malignant cells is of value only if a positive result is obtained. A negative examination does not rule out malignancy. For the most part, a pulmonary nodule is unfavorably located for the exfoliation of malignant cells.

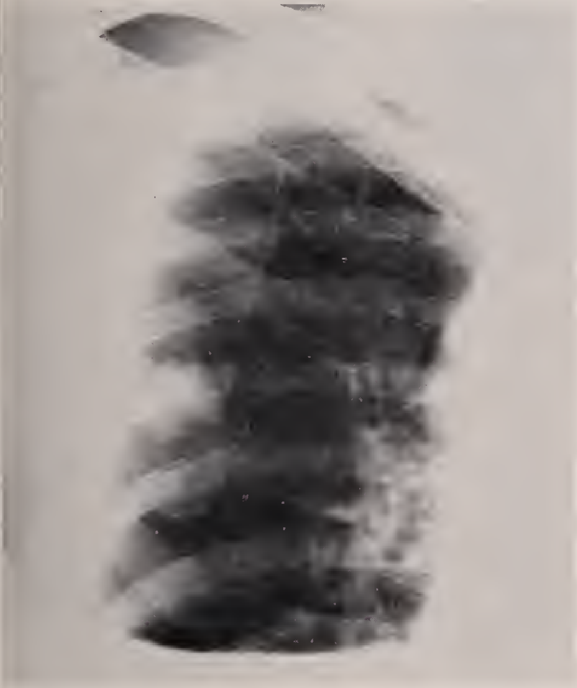


Fig. 3. Notching or umbilication of a border of a pulmonary nodule due to bronchogenic carcinoma.

Skin tests to determine the patient's sensitivity to tuberculin, histoplasmin or coccidioidin are at best inconclusive regarding the precise nature of the nodule. A positive reaction does not indicate that the nodule in question is responsible (Fig. 5). A series of negative reactions increases the suspicion of neoplasm. Some patients with a negative reaction may have a granuloma.

The sedimentation rate is frequently elevated in patients with malignant lesions but usually not in those with benign lesions. There is little justification for bacteriologic examination of the sputum of a patient with a solitary pulmonary nodule. Certainly there is no justification for waiting weeks for the results of a culture.

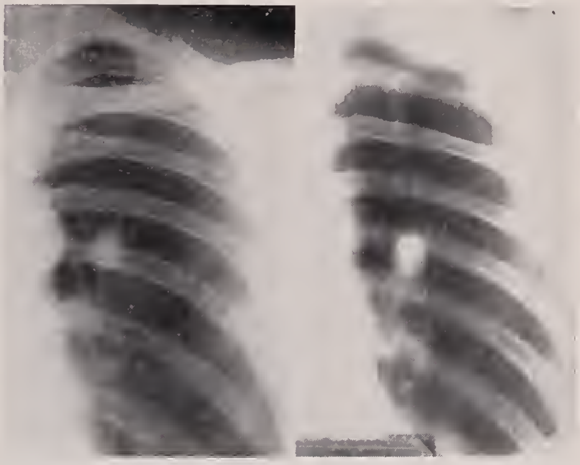


Fig. 4. Plain roentgenogram and planigram revealing calcium in a pulmonary nodule.

We believe that proper evaluation of a patient with a pulmonary nodule consists almost entirely of the use of roentgenographic techniques to include planigraphic films, survey of the patient from a general standpoint, and unless contraindicated, prompt surgical removal and histologic examination. The age of the patient and the roentgenographic appearance justified referring surgery in only 13 per cent of the patients in this series.

Metastatic Nodules

Knowledge of a malignancy elsewhere in the body or the history of a previously removed cancer is suggestive evidence of the metastatic nature of a pulmonary nodule but is by no means conclusive. Multiple primary cancers in unrelated systems can and probably will occur more frequently as survival rates improve. The appearance of a pulmonary nodule in a patient with a known cancer primary in another site may indicate the presence of a new primary cancer of the lung. Cahan[26] has reported only eighteen solitary metastases in the lungs during a period when 64 separate primary cancers of the lung were found at Memorial Hospital in patients with cancer at another site. This indicates a 3½ to 1 chance that a solitary pulmonary shadow is a separate primary lung cancer rather than a solitary metastasis in Memorial Hospital. One patient in our series has survived ten years following the removal by segmental resection of a primary adenocarcinoma of the lung occurring five years after the treatment of an epidermoid carcinoma of the cervix.

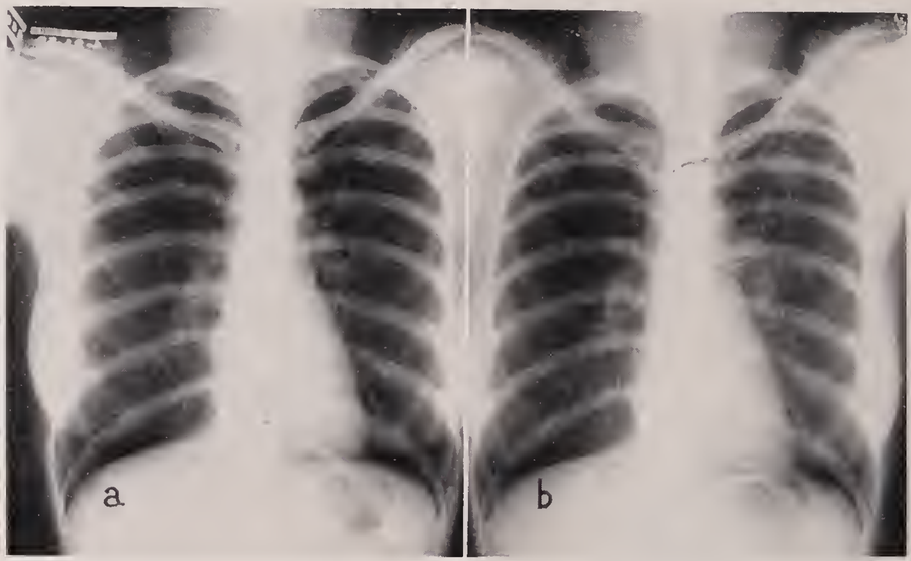


Fig. 5. (a) Pulmonary nodule, left upper lobe, interpreted as due to tuberculosis because of a positive tuberculin skin test and old scars in the contralateral lung.
(b) The same nodule ten months later, increased in size. Pneumonectomy was necessary at this time for an adenocarcinoma with extensive hilar and mediastinal metastases.

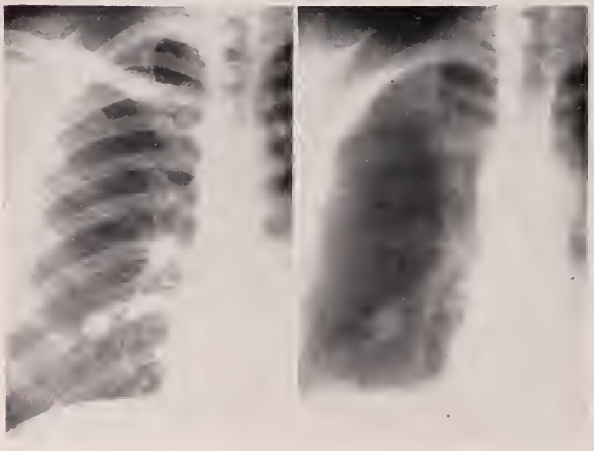


Fig. 6. Plain roentgenogram and planigram revealing pulmonary nodule in right lower lobe. Known seminoma of the testis. Excision of the nodule proved to be a hamartoma.

A benign tumor or a granuloma may likewise account for a pulmonary nodule in a patient with a known primary cancer in another site. Illustrative of this fact is the case of a thirty-six-year-old man who was found to have a pulmonary nodule shortly after the removal of a seminoma of the testis (Fig. 6). The nodule was removed and proved to be a hamartoma.

Synchronous cancers may occur in different organs and need not contraindicate surgery. In general, the more malignant lesion should be treated first. In most cases this will be the pulmonary lesion.

The mere presence of a pulmonary nodule does not justify exhaustive examinations in a blind search for a primary malignancy without any other indication that such a lesion is present. The removal of the pulmonary nodule alone will establish its true nature and if metastatic, frequently indicates the site of the primary tumor.

Those persons thought to have a metastatic pulmonary nodule should have planigraphic roentgen examinations done because multiple nodules may not be apparent in roentgenograms done by the usual techniques.

Granulomas

The resection of a pulmonary nodule due to granuloma is most often advised because it is often indistinguishable from a malignant nodule. This is true of all types due to tuberculosis, histoplasmosis, and coccidiodomycosis, particularly the last (Fig. 7).

One may also justify the resection of granulomas on the basis that these lesions are potentially dangerous from the standpoint of progression. Mitchell[27] has shown that after prolonged observation, there is about one chance in four of progression of disease when pulmonary tuberculosis is characterized by solitary dense circumscribed foci (tuberculomas) and has been treated without chemotherapy, resection or permanent collapse. Mathers[28] made a similar observation concerning twenty-three tuberculomas observed for from five to ninety months. Three tuberculomas cavitated with bronchogenic spread, four cavitated only, and five enlarged.

Matthiesen[29] has called attention to the surgical significance of solitary circumscribed lung nodules in histoplasmosis and states that surgical resection of pulmonary lesions is good treatment in the management of such localized histoplasmosis infections.

Summary

1. The importance of the pulmonary nodule lies in the fact that of 897 cases collected from the literature, 323 or 36 per cent were malignant.

2. The author's series of 180 patients having pulmonary nodules and ranging in age from six to eighty-one years has been reviewed. Eighty per cent of these patients were operated upon and the diagnosis proven pathologically. There were no surgical mortalities. The diagnosis could be made reliably on a clinical and roentgenographic basis in 13 per cent, and the lesions could not be classified in the remaining 7 per cent.

3. There were sixty-two patients with bronchogenic carcinoma or 34 per cent, seven with metastatic nodules or 4 per cent, and nine with bronchial adenomas or 5 per cent of the total. Forty-three per cent were malignant nodules. Only ten patients or 6 per cent of the total had true benign tumors.

4. The pulmonary nodule was produced by inflammation in seventy-four patients or 41 per cent of the total. Sixty-seven or 37 per cent of the total were classified as granulomas.

5. The age distribution revealed seven malignant nodules in forty-one patients under the age of forty years, an incidence of seventeen per cent. There were no bronchogenic carcinomas below the age of thirty-five years although there were two metastatic nodules and one adenoma below this age. The incidence of malignancy increases from 43 per cent in the fifth decade to 64 per cent in the seventh decade.

6. The results of resection for pulmonary nodules due to bronchogenic carcinoma indicate a 40 per cent survival rate for two years or more for the lesion with symptoms and a 70 per cent survival rate for the same period for the same lesion without symptoms.

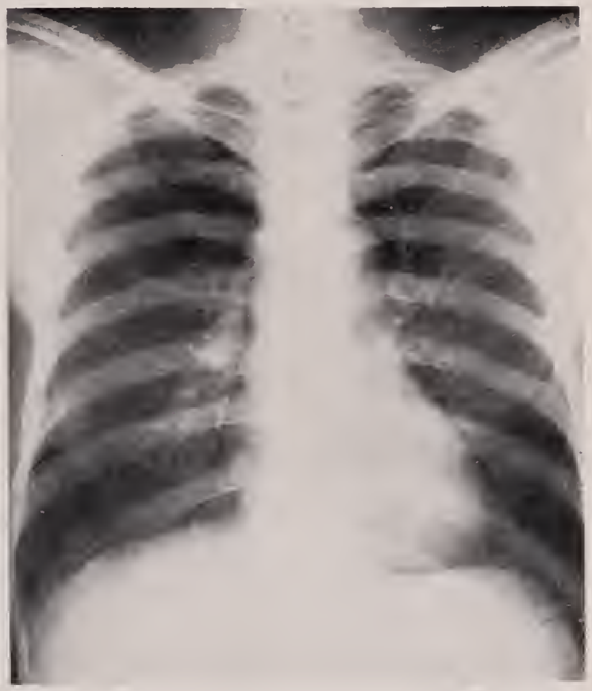


Fig. 7. Pulmonary nodule of medium size and soft density. Excision and examination revealed a coccidioidal granuloma.

7. The policy in general of prompt exploratory thoracotomy for the diagnosis and treatment of an indeterminate pulmonary nodule is on a sound basis.

8. The proper evaluation of a patient with a pulmonary nodule consists of the use of roentgenographic techniques to include planigraphic films, survey of the patient from a general standpoint, and unless contraindicated, prompt surgical removal and histologic examination. Extensive laboratory examinations are unjustified as inconclusive.

9. Resection of an apparent metastatic malignant nodule should be considered because of the possibility of the lesion being a separate primary lung cancer or a benign lesion, as well as for the opportunity of longer survival following the removal of a known metastasis.

them; the lower sphincter is formed by the true vocal cords and the muscles which adduct them.

The laryngeal ventricles are "alcoves" located to the side of the main laryngeal cavity. They open into the laryngeal airway between the upper and lower sphincters. The sacculus of the larynx is a small pouch connected to the superior portion of the ventricle. In activity requiring glottic closure, the air pressure may be transmitted to the ventricle and saccule because the true cord sphincter is weaker than the false cord sphincter; as the pressure in the tracheo-bronchial tree increases the lower laryngeal sphincter may be forced open. The laryngeal ventricle and saccule can then be distended.

Some activities involve general increase in pressure throughout the airway but do not entail glottic closure of the degree just described. These include sneezing, nose blowing, coughing, glass blowing and the playing of certain wind instruments.

Perhaps the presence of a congenital sac attached to the side of the laryngeal airway plus a force to distend that sac are necessary to the formation of a laryngocele. The experiments of Monselles,[11,12] (Florence) in 1900 seem to support such a view. He attempted to produce eversion of the ventricle artificially in thirty-three cases after death without success. In every case the mucous membrane instead of the submucosa was torn on attempting to draw out the lining of the ventricle.

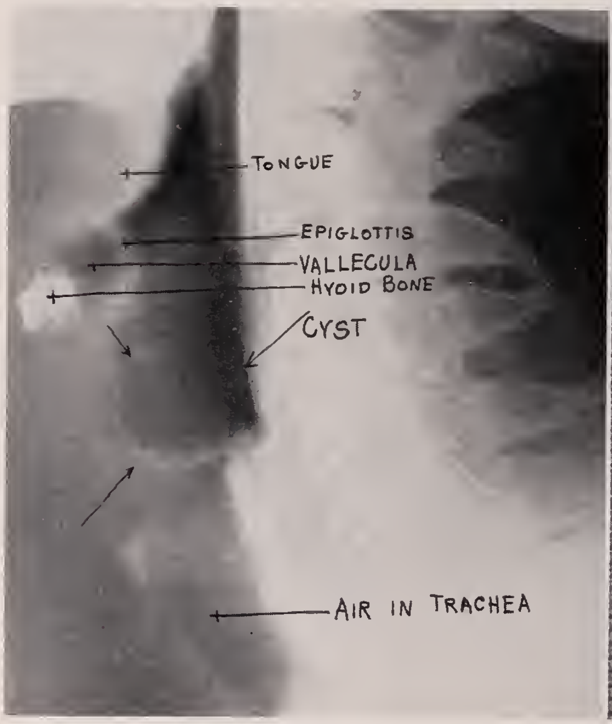


Fig. 2. (Case 1) Lateral view of the soft tissues of the neck showing air-filled cyst lying between the upper end of the larynx and the hyoid bone and projecting into the air-filled pharynx.

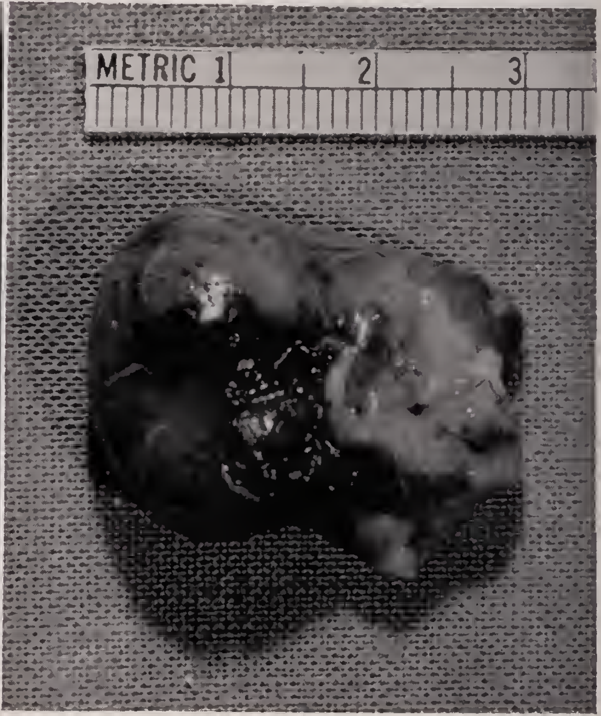


Fig. 3. (Case 1) Photograph of surgical specimen from Case 1 showing the air-filled sac, still intact, after removal from the patient's neck.

Laryngocele in man is divided into three classes by Lindsay[13] and by Allmans and Cordray.[14]

1. Internal laryngocele—a cystic dilatation within the larynx above the false cord extending to the aryepiglottic fold or base of the tongue (Freu). The cyst dilates on forced expiration; it deflates on quiet respiration. Hoarseness accompanies dilatation of the sac (see Case 1).

2. Superior external laryngocele—a cystic dilatation of the saccule of the ventricle that penetrates the thyrohyoid membrane just above the superior rim of the thyroid cartilage and anterior to the superior cornu, or just lateral to the thyroid notch. It appears as a swelling of the neck and enlarges on cough and exertion. It can be emptied by external pressure. Distention of the sac produces discomfort and headache due to pressure on the large veins of the neck. Infection and accumula-

tion of fluid in the sac is likely to produce coughing and expectoration of pus when the sac is compressed.

3. A combination of (1) and (2); (see Case 2).
4. A fourth type has been described as inferior external laryngocele, but verification of this type by dissection or operation appears to be lacking.

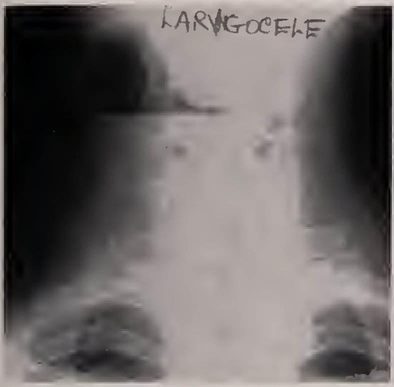


Fig. 4. (Case 2) Anteroposterior view of soft tissues of the neck showing laryngocele on the right side. The upper portion of the sac is filled with air and the lower portion with fluid. The fluid is forced into the airway by movements of the neck causing cough.

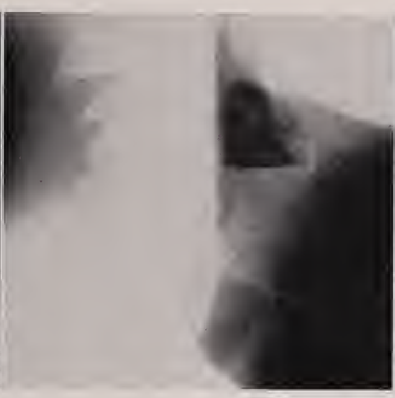


Fig. 5. (Case 2) Lateral view showing the same structures as described in Figure 4.

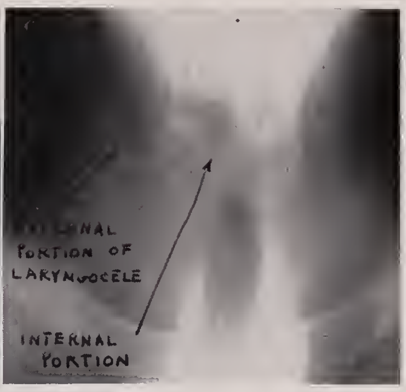


Fig. 6. (Case 2) Planogram of the neck in a posteroanterior view showing the combined internal and external laryngocele. As contrasted to the plain film shown in Figure 4, Figure 6 shows the inferior limits sac.

The symptoms of laryngocele will be noted in the reports of our cases. Cases 1 and 3 are examples of the internal type, while Case 2 is a combination of the internal and external types.

Case 1.—Mr. R. O. B., aged sixty-three years, was first examined by us in 1952. For the previous two months foods such as bread and meat had caught in his throat during swallowing. His wife said that he made a great noise when sleeping. This was not a typical snore but seemed to originate from a site in the lower pharynx. Other symptoms included hoarseness, cough, weight loss and marked sleepiness. The hoarseness grew worse as each day progressed, and the cough was non-productive but seemed to be due to irritation and not to excessive secretion within the respiratory tree. The man's weight had decreased 15 pounds in six months. There was no pain or dyspnea.

Indirect laryngoscopy revealed a large cyst on the right side of the larynx. It is interesting to note that the description of our case is the same as one described by Kistner in 1924.[10] He said, "Indirect inspection of the larynx revealed a large, smooth tumor obliterating the right aryepiglottic fold, bulging out toward the median line, obscuring any view of the right cord, ventricular band or arytenoid. The left arytenoid and its vocal process could be seen and were normal in appearance. The anterior two-thirds of the left cord could not be seen."

General physical examination showed no significant abnormality. In the ordinary films of the neck a rounded area of lessened density just above the right ventricular fold represented the laryngocele (Fig. 2). Planograms showed a large air-filled cyst filling the lumen of the larynx above the level of the ventricular folds and attached on the right. The possibility of an associated tumor was not excluded.

Tracheotomy under local anesthesia was carried out to assure patency of the airway during manipulation of the laryngeal cyst. When the incision was made into the trachea there was a sudden fall in blood pressure. Cocaine reaction or the curious syndrome exhibited by some patients having chronic hypoxia were considered as possible causes. Cocaine in a four per cent solution had been injected into the tracheal lumen a few minutes before opening the trachea. The patient's long standing sleepiness could have been due to chronic hypoxia. Nevertheless the removal of the laryngeal cyst was deferred for a few days.

Then a thyrotomy was done. The right ventricular fold was seen to be filled by a cystic mass. The soft tissues of the false cord were split along the cut edge and the mucosa peeled from the medial side of the cyst. The cyst was then shelled out carefully. The deep tissues of the ventricular band were separated from the thyroid cartilage and the cyst was delivered intact (Fig. 3). It contained air and floated in normal saline. The cyst was 2½ by 2½ by 3 cm. The wall was thin and on section the cyst was filled with air and mucus. The inner surface was smooth and was lined with normal appearing ciliated columnar epithelium. Within the wall of the cyst there were normal appearing mucus glands. The pathologist confirmed our diagnosis of laryngocele. The patient tolerated the procedure well and had an uneventful recovery.

Case 2.—Mr. C. L., aged thirty-six, complained of hoarseness of two months' duration and of a lump on the right side of his neck just above and lateral to the thyroid ala. His physician aspirated air and fluid from the mass in the neck. Subsequently he developed a secondary infection and fever. He responded to antibiotics but complained of a bitter discharge into his throat periodically. Planograms and plain posteroanterior and lateral x-rays of the larynx revealed a very large internal and external laryngopyocele partially filled with fluid and occupying the right side of the neck (Figs. 4, 5, 6). Indirect laryngoscopy showed a rounded mass protruding above the larynx at the level of the epiglottis (Fig. 7). The epiglottis was pushed sharply to the left.

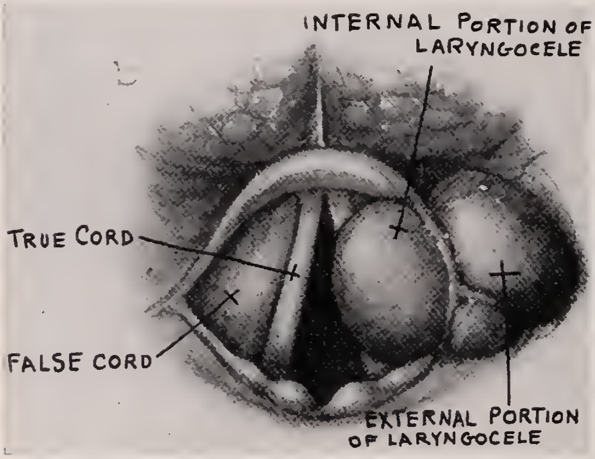

INTERNAL PORTION OF LARYNGOCELE
TRUE CORD
FALSE CORD
EXTERNAL PORTION OF LARYNGOCELE

Fig. 7. (Case 2) Drawing of the view obtained with a mirror in Case 2 except that this figure shows a left-sided laryngocele, while our case was right sided. (From W. B. Hoover: Laryngocele. *Surgical Clinics of North America*. Philadelphia: W. B. Saunders, 1952.

At surgery a horizontal incision was made from the right sterno-mastoid muscle to the midline at the level of the hyoid bone. This was directly over the center of the mass. The skin, superficial fascia, platysma and deep fascia were divided. Under the deep fascia a cyst wall was visualized. It was picked up carefully and dissected out from its bed. The bed consisted of the hyoid bone and its attached muscles; the cyst passed the midline and at this time it was dissected off of the pharyngeal mucosa. It extended caudad for a distance of about 6 cm. and was dissected out until its attachments disappeared at its anterior medial end under the right ala of the thyroid cartilage just lateral to the thyroid notch. The entire structure at this point was not over 1.0 mm. in diameter. A midline incision extending from the thyroid notch down to the suprasternal notch was made. A tracheotomy was then done. The thyroid alae were separated from one another using an electric saw. On looking for the cut end of the sac it couldn't be found, but there was an opening in the midline at the point where the sac had been. This represented the retracted end of the sac where it attached to the patient's laryngeal ventricle. The opening was exactly opposite to the other laryngeal ventricle. The sac had already been completely removed, but we had not realized it and opened the larynx in the midline expecting to find the stub end of the cyst. The total volume of the sac was 120 cc. It was filled partially with a thick whitish fluid.

The cyst measured 5 by 3 by 2½ cm. The wall was thin and the lumen was filled with a cloudy mucus. Microscopic examination showed the cyst to be lined by respiratory tract epithelium. Beneath the epithelial lining were normal appearing mucus glands and evidence of recent hemorrhage into the fibrous connective tissue. The diagnosis was laryngocele. The patient tolerated the procedure well. For many months he had paralysis of his right vocal cord. This recovered completely.

It is not easy to believe that this man's cyst arose from forcible over-distention of a normal laryngeal ventricle. It must have been a congenital anomaly, probably a vestigial air-sac, and became distended when the tract connecting it to the larynx opened up, possibly due to coughing or straining.

Case 3. J. B. G., a seventy-four-year-old man, had slight hoarseness and was examined to rule out laryngeal cancer. The findings on physical and x-ray examinations were exactly like Case 1, but the cyst was small. This man had been observed from time to time for two years, and has no significant trouble. No surgery was necessary in this case. Laryngocele and cancer of the larynx have been reported in the same case by Schall.[16]

Summary

Three cases of laryngocele are presented, two of the internal type, the other a combination internal and external laryngocele. The history, anatomy, histology and etiology are reviewed.

References

1. Negus, V. E.: Comparative Anatomy and Physiology of the Larynx. New York: Grune and Stratton, 1949.
2. Larrey, D. J.: Clinique Chirurgicale, exercee particulierement dans les camps et les hospiteaux militaires depuis 1792 jusqu'en 1829, 2:28, 1829. Cited by Richards.[3]
3. Richards, Lyman: Laryngocele. Ann. Otol., Rhin. & Laryngol., 60:510-522, 1951.
4. Virchow, R.: Die Krankhafter Geschwulste, 3:35, 1867. Cited by Taylor.[5]
5. Taylor, H. Marshall: Ventricular laryngocele, Ann. Otol., Rhin. & Laryngol., 53:536-543, 1944.
6. Von Hippel: Cited by Richards.[3]
7. Lothrop, Oliver A.: Laryngopyocele. New England J. Med., 229:681-682 (Oct. 28) 1943.
8. Freedman, A. O.: Diseases of the ventricle of Morgagni with special reference to pyocele of a congenital air sac of the ventricle. Arch. Otol., 28: 328-343, 1938.
9. Kan, St. L. (Leiden): Ueber einen Fall von kongenitalen Larynxluftsachen bei einem Kinde von sechzehnten Tagen. Ztschr. f. Laryng., Rhin., Otol., 1:51, 1908. Cited by Kistner.[10]
10. Kistner, F. B.: Pneumatocele and pyocele of the sacculus. Ann. Otol., Rhin. & Laryngol., 33:891-897, 1924.
11. Monselles, S. (Florence): Ueber das Vorkommen eines auf der Eversion einer Morgagnischen Tasche aufsitzenden Polypus Laryngis.

(Continued on Page 156)

Esophageal Hiatus Hernia

R. H. LA BREE, M.D.,
and J. FULLER, M.D.
Duluth, Minnesota

SINCE the subject of esophageal hiatus hernia is extensive, we propose to discuss only that type of diaphragmatic hernia. Other types of diaphragmatic hernias present different problems and will not be considered.

A diaphragmatic hernia is found frequently during routine gastrointestinal x-ray examinations, occurring in between 1 to 2 per cent of these studies.[1] Of these, more than 98 per cent are of the hiatal variety.

There are several classifications of hiatus hernia, but that most commonly used divides these defects into four anatomic types. These four types are:

1. The congenital short esophagus with thoracic stomach, a rare condition.
2. The hiatal esophageal hernia with a shortened esophagus.
3. The esophageal hiatal hernia of the sliding variety. This is the most common type.[2]
4. Para-esophageal hernia through the esophageal hiatus.

In the latter two types, the esophagus is of normal length. In type 4, the esophagus remains fixed in the hiatus, the stomach herniating through the opening beside the esophagus. In this variety, the esophago-gastric junction remains below the diaphragm. In type 3, the lower end of the esophagus is not fixed, but withdrawn into the posterior mediastinum with a portion of the stomach. Here, the esophago-gastric junction is drawn up above the diaphragm. For practical purposes, types 3 and 4 will be considered together, since their differentiation is only of academic interest. In type 2, shortening of the esophagus is apparently due to scar contracture, a result of ulceration and esophagitis.

Since an accurate anatomic knowledge of the parts concerned is necessary in any hernia repair, brief mention should be made here of the normal hiatal structure and the basic faults found in hiatal defects. Carey and Hollinshead[2] have shown that the normal diaphragm about the hiatus is formed from the right crus which splits into a deep and superficial layer. In a few cases, a few fibers from the left crus cross to the right over the aorta to form part of the right margin of the hiatus. This, however, is uncommon. The transversalis fascia of the abdominal wall is continued on to the inferior surface of the diaphragm as the diaphragmatic fascia. As it approaches the esophagus, it is called the diaphragmatico-esophageal fascia or the phreno-esophageal ligament. This ligament passes through the hiatus to insert in the lower part of the esophagus 2 or 3 cm. above the esophago-gastric junction. Enough strength and flexibility are present in this structure to resist traction of the stomach into the thorax and yet allow some movement of the cardia with swallowing and change of body position.

Carey and Hollinshead have pointed out that there are three basic defects present in hiatal hernia: (1) The first is a redundant peritoneal sac which extends through the hiatus and is located on the anterolateral aspect of the upper part of the stomach and the lower part of the esophagus. This sac does not pass all the way around the underlying organs. (2) The second basic defect is stretching of the phreno-esophageal ligament. (3) The third defect in hiatal hernia is distortion or weakness of the right crus, the muscular collar of the hiatus.

Symptoms and Complications

In hiatus hernia, symptoms may be mild and not particularly related to the size of the defect. Small sliding hernias may produce great distress. Often the manifestations are vague, but the disease should be suspected in patients with abdominal symptoms or persistent refractory anemia. Certainly, it is reasonable to think that a large number of so-called pseudo-cardiacs and air-swallowers actually are suffering from undiscovered hiatal hernias. In our own experience, the dis-

---

From the Department of General and Thoracic Surgery, The Duluth Clinic, Duluth, Minnesota.

ease has in several instances been mistaken for coronary heart disease.

A hiatus hernia syndrome has been described[3] consisting of: (1) a feeling of pain, fullness or distress in the epigastrium or substernal area, coming on at the beginning of a meal. It may be so severe that the patient has to stop eating. (2) When the patient gets up and walks about, symptoms suddenly disappear, and the patient can continue the meal. It has been said that this symptom complex practically permits a diagnosis of hiatus hernia.

Frequent symptoms are pain, distress, eructation, vomiting, dyspnea, palpitation, belching, and weakness. Substernal burning is not uncommon and may be due to esophagitis. We have seen several patients who have complained of burning pain in the neck, jaws, and ears. Incompetence of the so-called cardiac sphincter permits regurgitation of acid stomach contents resulting in sour eructations or acid regurgitations, and even esophagitis. Some patients note that bending over results in epigastric distress and the feeling of hot, sour fluid running down into the mouth. Because of the position of the esophago-gastric junction above the diaphragm and the loss of the natural sphincter action normally present at the hiatus, this latter symptom seems to be more characteristic of the sliding variety of hiatal hernia. Frequently, we encounter individuals who assert that lying down after a fairly large meal will almost certainly produce trouble, and often there is distress at night that is relieved by getting up and walking around.

Hemorrhage with secondary anemia is said to be quite common although we have seen this complication in only three patients. Peptic ulcer of the esophagus, due to regurgitant esophagitis, may occur and has been seen in one of our patients. Perforation with mediastinitis may result. If severe ulceration of the esophagus continues untreated, stenosis and cicatricial shortening of the esophagus may result. This end result may require dilatation of the structures, and some authors have even resorted to resection and esophagogastrectomy.

The diagnosis may be suspected from the history. It must be finally made by the radiologist. Many technical points have to be considered in the roentgen diagnosis of hiatal hernia, and these will not be considered here. Of importance, however, is the demonstration of length of the esophagus, position of the esophago-gastric junction and its relation to the diaphragm, and size of the hernia. Often, only the head-down position will reveal the defect. Large, irreducible hernias are detected easily, but the small ones are often quite difficult to demonstrate. For this reason, it is often advisable to repeat the x-ray examination in the event of negative findings when the clinical indications are typical. In one of our patients, three x-ray examinations were necessary before the hernia was finally discovered.

Esophagoscopy is of great importance. It is the only way to evaluate adequately the degree of regurgitant esophagitis. Every patient with an esophageal hiatus hernia who has a history of dysphagia or bleeding should be esophagoscoped. Some people feel that all patients with an esophageal hiatus hernia should have such an examination preoperatively. The endoscopist can provide the surgeon with valuable information, including a fairly accurate estimate of length of esophagus, a very important factor not always apparent in the x-ray examination. Lastly, esophagoscopy will rule out any unsuspected lesion such as carcinoma low in the esophagus or in the cardia, mucosal cyst or tumors, or diverticulum of the esophagus.

Patients with small hernias and minimal symptoms may be handled satisfactorily by medical management. This includes anti-acids, antispasmodics, and more frequent smaller bland feedings. We feel it is also important to elevate the head of the bed on one-foot blocks. For the obese patient, a reduction plan is most important.

In all cases, except in those patients with very large hernias or those with severe symptoms or regurgitant esophagitis, we try a period of conservative remedy. Many internists, who usually see these people first, seem to feel that such hernias, especially small ones, seldom produce symptoms and do not deserve surgical treatment. Nevertheless, those we see who come to operation have usually been on a plan of medical therapy without much success. It is the opinion of some surgeons that symptoms are really complications, and since all hernias should be repaired before complications develop, so should hernias of the esophageal hiatus. We have not assumed quite as radical a position, feeling that each individual, his symptoms and circumstances, requires particular consideration. Certainly, not every patient with hiatus hernia needs an operation.

If gastrointestinal symptoms are not sufficiently relieved by a conservative plan or if complications do arise, surgical correction is advisable and, at times, mandatory. Contraindications to operative relief are: (1) undue esophageal shortening, (2) obesity of marked degree, (3) a good chance of later pregnancies, (4) symptoms not certainly due to the hernia, (5) poor general condition of the patient. Absolute contraindications to the procedure are the very short esophagus with or without a stricture and the extremely obese patient who will not diet.[4]

Surgical repair may be by the abdominal or thoracic approach. One is afforded better visualization of the defect, the sac, and the esophagus by the thoracic approach, but, unfortunately, a thorough abdominal exploration is not so easily done. In our experience, a thoracic approach has been entirely satisfactory, and we prefer it in the majority of cases.

Our thoracic procedure has been generally patterned after that described by Allison[5] with a few modifications of our own. The left chest is opened through the bed of the resected eighth or ninth rib. The inferior pulmonary ligament is divided, and the mediastinal pleura incised. A previously inserted nasal tube facilitates identification of the esophagus. The latter structure is mobilized together with the hernial sac and stomach. Some care must be exercised to avoid entering the right pleural space. A traction tape is passed around the esophagus to aid in maintaining reduction of the hernia later. A short incision is made in the left leaf of the diaphragm between the muscular and tendinous portions but avoiding incising the esophageal hiatus. Through this incision, the fingers of the left hand are passed, and then the fingers are thrust upward into the hiatus to identify and tent-up better the peritoneal sac. The latter is opened from above and is partially excised. It must be remembered that the sac does not encircle the viscus completely. Therefore, it cannot be excised as one does a redundant peritoneal sac in the repair of the usual inguinal hernia. The esophagus is then drawn downward by means of the traction tape which is passed through the esophageal hiatus; that is, through the opening in the sac and then back out through the incision in the diaphragm. The superior cut margin of the phreno-esophageal ligament, which, as we mentioned earlier, had been part of the hernial sac, may then be sutured to either the thoracic surface of the diaphragm or the abdominal surface of the diaphragm. We have used both methods and find that the former is easier. A few interrupted silk sutures are used for this. The suturing of the phreno-esophageal ligament should maintain the reduction. Additional sutures may be placed between the cardia and the diaphragm from below as recommended by some authors.

The next and probably most important step is to identify and clean carefully the fibers of the right crus and to suture them behind the esophagus. Usually, two or three interrupted silk sutures suffice. This closure is made snug enough to allow the tip of the fifth finger to be inserted between the esophagus and the sutured crus. If one wants to be especially certain that harmful narrowing will not occur, the most superior suture next to the esophagus may be of chronic catgut. This will allow subsequent dilatations if the new hiatus is too tight. Finally, the incision in the diaphragm is closed with interrupted silk, the mediastinal pleura closed likewise, and the chest wall reconstructed. Three catheters are left in place for suction drainage for twenty-four to forty-eight hours. It should be mentioned that we rarely crush the phrenic nerve.

We have operated upon twenty-four patients for diaphragmatic hernia. Eighteen of these patients had esophageal hiatus hernias. Only one of these was of the para-esophageal type. Eight of these patients were males and ten females, a proportion not in accord with figures generally reported. Most of our patients were of the stocky, sthenic build, and several had been considered psychoneurotic following earlier examinations. One fifty-two-year-old woman complained of postprandial throat pain which was completely relieved by repairing her esophageal hiatus hernia.

Only five patients had esophagoscopy preoperatively, but esophagitis was found in four. One of these patients had a peptic ulcer of the esophagus with a refractory anemia which was cured by repairing his hernia.

A throacic repair was performed in sixteen of the eighteen patients. Medical treatment had been given a thorough trial in all. There were no operative deaths, and the average postoperative hospital stay was only nine days. Complications

(Continued on Page 166)

Lymphosarcoma

Unusual Extranodal Primary Manifestations

CLEON R. HOLLAND, M.D.
and WALLACE A. MERRITT, M.D.
Rochester, Minnesota

THE initial manifestation of lymphosarcoma, in the majority of cases, is enlargement of superficial lymph nodes. We wish to report four cases in which the primary symptoms arose in extranodal sites. A limited review of the literature indicates the relative rarity of lymphosarcoma in which the primary symptoms arise extranodally.

Lymphosarcoma may arise in any organ which contains lymphoid aggregates. At the New York Memorial Hospital[1] visible and palpable external glandular swelling contributed the first evidences of the disease in 65 per cent of 196 patients with this condition. Symptoms referable to the abdomen occurred in 17.5 per cent of cases. In 11.6 per cent, the first complaint concerned difficulties in the upper part of the respiratory tract. Thoracic symptoms were first to appear in only 3.6 per cent, and pain in bone occurred initially in 1.83 per cent. Systemic manifestations, including fever, sweating and loss of weight, are conspicuously absent until the late generalized stage of lymphosarcoma, in contradistinction to what happens in Hodgkin's disease.

One has only to read some of the older literature on disease of the lymph nodes to recognize the confusion that has existed in the terminology of the various types of lymphomas. For this reason, comparison of statistics concerning lymphosarcoma as it affects various organs, based on reports in the literature, is difficult.

During the past four years we have seen four patients in whom lymphosarcoma was first manifested by symptoms referable to extranodal sites. The organs involved were an extra-ocular muscle, the frontal bone of the head, the left lung and the prostate gland. In three cases, the disease later became generalized.

Report of Cases

Case 1.—A white woman, fifty-seven years old, registered at the Mayo Clinic on January 17, 1949, complaining of a sensation of a foreign body in the left eye of approximately six months' duration. A firm mass was noted on the left eyeball at about the insertion of the inferior rectus muscle. It was known that the patient had had a moderate degree of hypertension for approximately fifteen years. In 1946 she had complained of two attacks of vertigo, and a cerebrovascular accident had been suspected. Blood pressure in 1949 was 210 systolic and 115 diastolic, expressed as millimeters of mercury. Except for moderate obesity, the physical examination disclosed nothing abnormal; adenopathy or splenomegaly was not noted.

On January 18, 1949, the inferior rectus muscle of the left eye was excised. It was found to contain a tumor which on microscopic examination was reported as being a lymphosarcoma of the lymphocytic type. Additional treatment consisted of the application of radium to the region of the left orbit on January 21 and 24, and April 26. After this, the patient noted diplopia when she looked down or to the left.

The patient was next seen on February 19, 1952, complaining of fatigue, apathy, loss of appetite and a nonproductive cough. Physical examination disclosed mild hypertension, obesity and a cervical polyp, which was removed. There was no significant adenopathy or obvious recurrence of the left orbital tumor. A moderate number of erythrocytes were noted on microscopic examination of the urine. There was a mild degree of hypochromic anemia, and the erythrocyte sedimentation rate was 105 mm. in one hour (Westergren). Roentgenologic examination of the thorax showed changes consistent with the findings of multiple pulmonary metastasis (Fig. 1a). Because of the hematuria, excretory urograms were made which showed no evidence of renal neoplasm. Roentgen therapy to the thorax was employed; marked regression in the multiple nodular densities ensued (Fig. 1b).

In June, 1952, a tumor was noted in the right upper eyelid. This was treated with roentgen-ray irradiation in June, July and August, 1952.

A nodule in the right lower eyelid was treated with roentgen rays in November, 1953.

In April, 1954, a nodule in the left lower eyelid was treated with roentgen rays.

Read at the meeting of the Southern Minnesota Medical Association, Albert Lea, Minnesota, September 12, 1955.

Dr. Holland is a Fellow in Surgery, Mayo Foundation, and Dr. Merritt is from the Section of Medicine, Mayo Clinic and Mayo Foundation. The Mayo Foundation, Rochester, Minnesota, is a part of the Graduate School of the University of Minnesota.

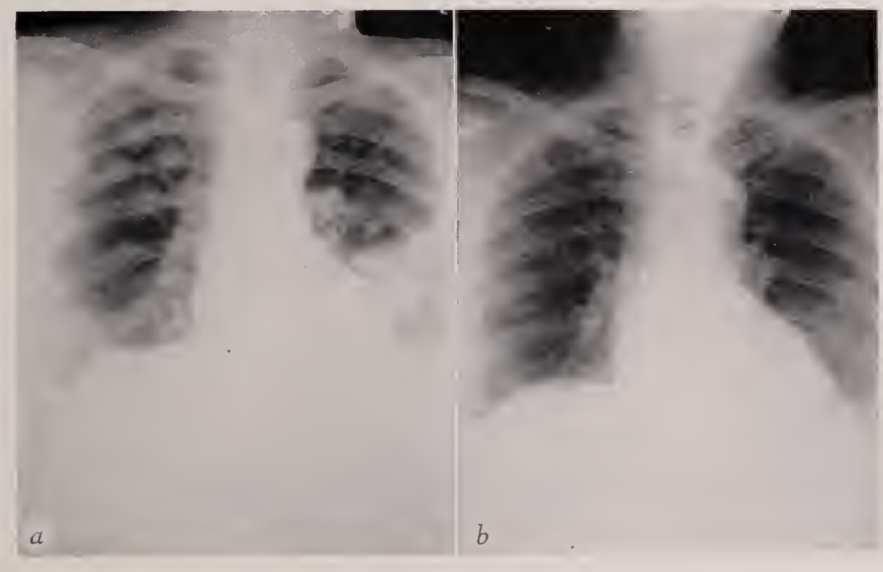


Fig. 1 (Case 1). (a) Thoracic roentgenogram on February 20, 1952, showing changes consistent with the presence of multiple pulmonary metastatic lesions. (b) Thoracic roentgenogram six months later, after roentgen therapy. Note clearing of lesions.

In January, 1955, the patient noted a burning pain in the right posterior thoracic region. At this time roentgenologic examination of the thorax revealed four nodular lesions in the field of the right lung and two similar lesions in the field of the lower part of the left lung. (Fig. 2). Roentgen therapy was again directed over the thorax. It is interesting to note that in spite of specific examination of superficial nodal areas, at no time has there been significant enlargement of lymph nodes.

Comment on Case 1.—In the group of patients seen at New York Memorial Hospital[1] the orbit was involved primarily in 0.5 per cent. Duke-Elder also mentioned lymphosarcoma in enumerating tumors involving the eye, without specifically mentioning the extra-ocular muscles.

Case 2.—A sixty-three-year-old farmer registered at the Mayo Clinic on January 6, 1955. His history was interesting in that he had been treated at the same clinic in 1936 for proved cervicofacial actinomycosis. The illness he had in 1955 had begun two months prior to his admission, when he had noted frontal headaches that were present day and night. Three weeks prior to this admission he had first noted three bony protrusions in the frontal area of the scalp, each approximately 1 cm. in diameter. One and a half years previously he had noted the onset of increased shortness of breath on exertion, and on one occasion he awoke at night feeling short of breath. There was no history of angina or edema of the ankles.

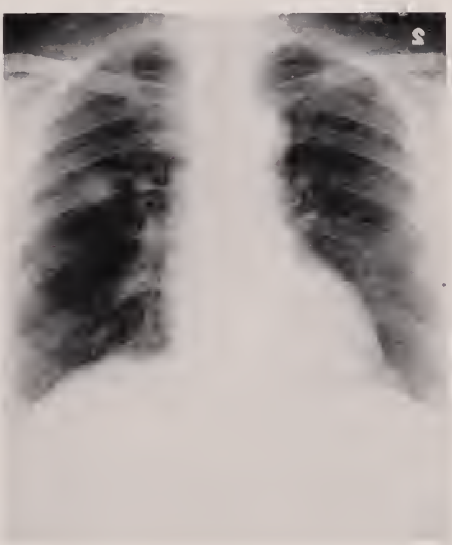


Fig. 2 (Case 1). Thoracic roentgenogram on January 21, 1955, showing recurrence of lesions in both lungs.

The bony protrusions in question were readily palpable over the frontal area of the skull. The heart was moderately enlarged, but there was no clinical evidence of increased venous pressure, pulmonary congestion, or edema of the ankle. The blood pressure was 122 systolic and 102 diastolic, in millimeters of mercury. The pulse rate was 124 per minute, and the electrocardiogram revealed delayed A-V conduction and left bundle-branch block. There was no significant lymphadenopathy and the spleen was not enlarged. Albuminuria was graded 3, and erythrocyturia, 2. Values for hemoglobin, erythrocytes and leukocytes were normal. The sedimentation rate was 21 mm. in one hour (Westergren). The value for urea was 64 mg. per 100 cc. of blood, and the reaction of the Kline test was negative.

A roentgenogram of the thorax showed cardiac enlargement; roentgenograms of the skull demonstrated destructive lesions of the frontal bone. Results of neurologic examination were negative. It was decided to obtain specimens of the lesions in the frontal bone for biopsy. After digitalis had been administered to the patient, a specimen of tissue was removed from one of the nodules on the frontal bone by Dr. R. H. Miller, of the Section of Neurologic Surgery. Biopsy demonstrated a picture consistent with the diagnosis of lymphosarcoma.

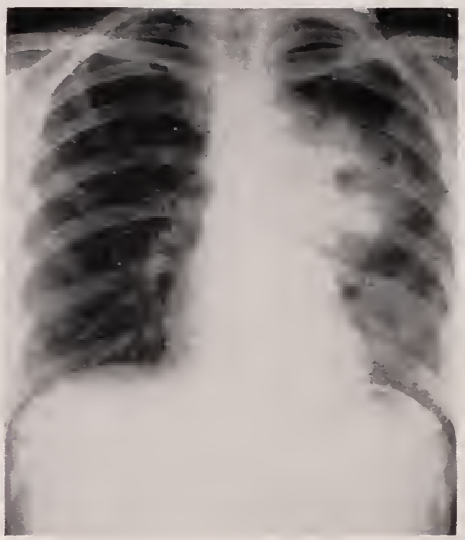


Fig. 3 (Case 3). Thoracic roentgenogram on April 5, 1954, showing extensive consolidation in the upper lobe of the left lung and multiple areas of cavitation.

Roentgen-ray treatment was directed to the frontal region of the skull daily for ten days, after which the nodules disappeared and the headaches were relieved.

Two months later the headaches returned, with associated swelling of the left supra-orbital ridge. Because of the atypical nature of the bony involvement, sternal aspiration was performed and hypocellular marrow was obtained thereby. Malignant cells were not found, nor were multiple myelomas. A second course of roentgen-ray therapy consisting of ten treatments to the left frontal region was administered.

Within one week bony enlargement of the right supra-orbital ridge was noted, and it rapidly increased.

Within three weeks of the time of the last treatment massive bony enlargement of the right frontal region was evident, while the left side remained normal. The right eye was swollen shut. A third course of roentgen-ray therapy consisting of eight treatments was directed to the whole frontal area, including the orbital areas. After this, the swelling subsided and the pain disappeared.

Comment on Case 2.—Cortical or medullary involvement of bone is relatively common in the terminal stages of lymphosarcoma. However, involvement of bone as a primary manifestation of the disease is relatively rare. The New York Memorial Hospital workers reported it as occurring in only 1 per cent of their cases. In the presence of lymphosarcoma the lesions are mostly osteolytic (85 per cent). Localized pain and tenderness are the most frequent clinical indications of lesions of bone in this disease.[2]

Case 3.—A thirty-nine-year-old white woman registered at the Mayo Clinic on April 5, 1954. She said that in January, 1953, an infection of the upper part of the respiratory tract had been followed by generalized pruritus and recurrent infections of the skin. Increased nervousness and fatigue gradually developed, and a cough started which was productive of purulent sputum, occasionally blood-streaked. Various antibiotic agents were administered, as well as vitamin B_{12} and iron. At no time did the patient experience pain in the chest or dyspnea.

At the time of her admission she had lost approximately 8 pounds. The physical examination disclosed nothing abnormal. Roentgen-ray examination of the thorax showed changes considered to be those of extensive consolidation in the upper lobe of the left lung and multiple areas of cavitation (Fig. 3). There was a small patch of pneumonitis with central cavitation in the lingula. The value for hemoglobin was 10.6 gm. per 100 cc. of blood; erythrocytes numbered 4,010,000 and leukocytes 7,600 per cubic millimeter of blood. The erythrocyte sedimentation rate was 109 mm. in one hour (Westergren). The reaction to tuberculin skin tests was negative in first and second strengths. Microscopic examination of the sputum did not reveal evidence of tuberculosis or malignant cells. Subsequent culture of specimens of sputum gave negative results for tubercle bacilli as well as for fungi. Bronchoscopic examination showed purulent secretions exuding from the bronchus of the upper lobe of the left lung, but no evidence of obstruction.

The patient entered the hospital for a ten-day period of treatment with nebulized penicillin and streptomycin, as well as the parenteral administration of the same drugs. Roentgenograms of the thorax at the end of this period disclosed no appreciable changes in the appearance of the lesions in the lung.

On April 21, 1954, Dr. John W. Kirklin explored the left lung. The upper lobe was found to be massively involved with an inflammatory and cavitary lesion. There was also a similar but smaller lesion in the posterior, basilar segment of the lower lobe. Left pneumonectomy was performed. The surgical pathologist reported lymphosarcoma (Hodgkin's type) extensively involving the upper lobe and a small nodule of tumor in the lower lobe. In view of the apparent localized nature of the process, no further treatment was given. The patient was discharged from the hospital on the eleventh postoperative day.

The patient returned for re-examination on August 2, 1954. At that time there was no evidence of recurrence of the lymphosarcoma, and a roentgenogram of the thorax showed no changes in the right lung. The pruritus had receded markedly.

In early January, 1955, the patient noted a dull, aching soreness in the left shoulder, extending into the neck and down the left arm to the elbow. The pruritus became more troublesome. The patient said that the consumption of any alcoholic beverages aggravated the pain.

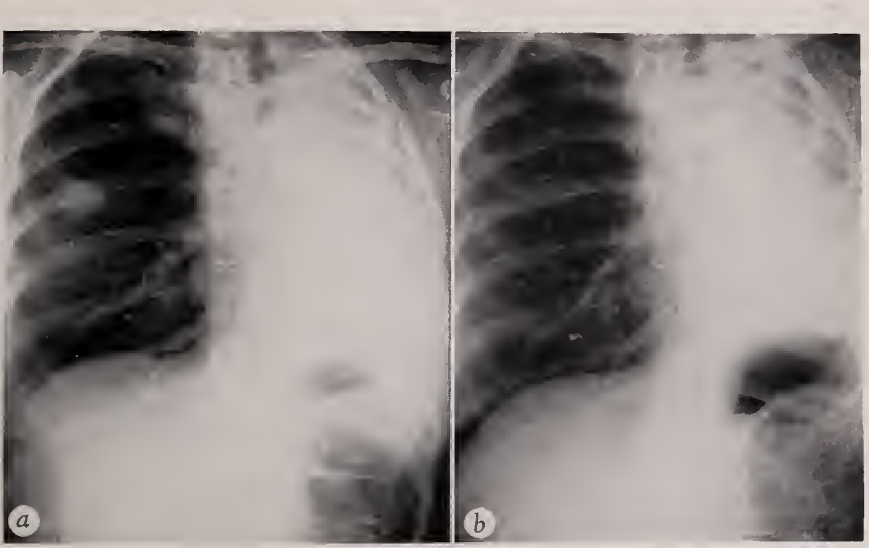


Fig. 4 (Case 3). (a) Thoracic roentgenogram on January 24, 1955, showing the results of left pneumonectomy and two nodular areas in the right lung. (b) Thoracic roentgenogram two months later, showing disappearance of nodules in right lung after roentgen therapy.

She was seen again on January 21, 1955, and at this time the physical examination showed no significant abnormalities. A roentgenogram of the thorax showed the results of left pneumonectomy and two nodular areas in the right lung near the anterior ends of the first and third ribs (Fig. 4a). The latter were assumed to be caused by lymphosarcoma. Roentgen-ray therapy was administered to the thorax.

After this, the patient felt much improved until March 14, 1955, when she noted increased weakness, cough, low-grade fever and more intense pruritus.

She was again examined on March 28, and except for excoriations over the skin, nothing abnormal was found. Roentgenograms of the thorax showed that two nodular lesions in the right lung had disappeared (Fig. 4b). While there were no demonstrable focal areas of lymphosarcoma, it was felt advisable to administer nitrogen mustard. The patient received this form of treatment in her home city.

Comment on Case 3.—Primary lymphosarcoma of the lung has been reported infrequently in the literature; however, secondary involvement is not uncommon. The diagnosis when the process is primary in the lung is made only at the time of operation, and microscopic examination of removed tissue is then necessary.[3-5]

Case 4.—A thirty-two-year-old white farmer from Nebraska registered at the Mayo Clinic on June 28, 1951. He was admitted to a hospital the same day. His history was not significant, except that he had undergone hemorrhoidectomy elsewhere in March, 1951. Three months prior to his admission he had noted the onset of frequent urination, day and night. These symptoms increased in severity, and a week prior to his admission he noted general malaise and felt an orange-size mass in the suprapubic region. He received a urinary antiseptic agent, and at the time of his admission the frequency of urination had diminished and the suprapubic mass had disappeared.

We found that the blood pressure was 140 systolic and 80 diastolic, in millimeters of mercury. There was evidence of some dehydration. Rectal examination revealed an ill-defined mass in the region of the prostate gland; this mass spread laterally and seemed to surround the apex of the bladder. There was no significant enlargement of lymph nodes and the spleen was not palpable. Excretory urography disclosed a moderate degree of hydronephrosis involving both kidneys (Fig. 5a). Albuminuria was graded 3, pyuria, 1 (on the basis that the least amount is grade 1 and the greatest amount, 4) and erythrocyturia, 1 (on the basis that the greatest amount is graded 5). Values for hemoglobin and the erythrocyte count of the blood were normal. The sedimentation rate was 101 mm. in one hour (Westergren). The value for urea was 42 mg. per 100 cc. of blood. Roentgenologic examination of the thorax, pelvis and spinal column disclosed nothing abnormal.

Cystoscopic examination performed by Dr. E. N. Cook disclosed chronic, diffuse cystitis, with considerable shagginess and mucosal hypertrophy over the trigone and base of the bladder. Biopsy of a section of tissue from the region of the prostate gland demonstrated lymphosarcoma of the lymphocytic type.

Roentgen-ray treatment over a fifteen-day period was directed to the bladder and perineum. The patient returned home on July 23, 1951.

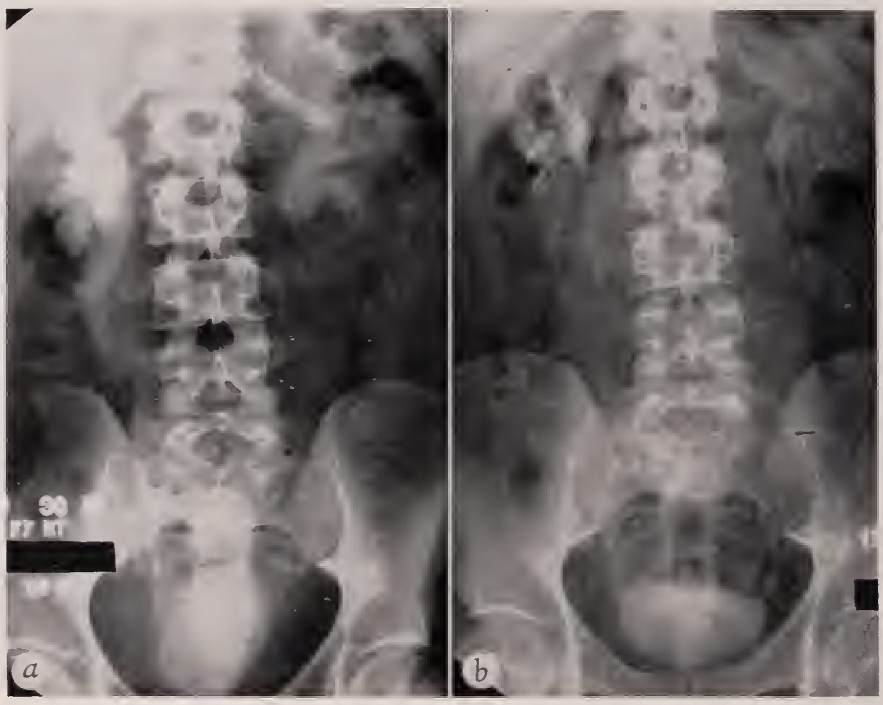


Fig. 5 (Case 4). (a) Excretory urogram on June 30, 1951, showing moderate degree of hydronephrosis involving both kidneys. (b) Excretory urogram four months later, showing essentially normal-appearing renal pelves.

The patient returned for re-examination on October 31, 1951. At that time he had no complaints. The prostate gland seemed to be normal at rectal examination. Excretory urography revealed essentially normal-appearing kidneys (Fig. 5b). Cystoscopic examination demonstrated a minimal amount of prostatic fullness. No treatment was given.

Results of examination again were normal on February 1, 1952, but when the patient returned on June 6, 1952, an enlarged lymph node was found in the left posterior cervical triangle. There was also a mass in the midabdomen, considered probably to represent periaortic lymphadenopathy, and there was some degree of infiltration of the prostate gland. Roentgen-ray therapy was directed to these three areas.

In September, 1952, the patient noted a mass just above the navel, and he received roentgen-ray treatment to this area.

In December, 1952, perirectal infiltration associated with diarrhea was found, and again he received roentgen-ray treatment. In February, 1953, additional involvement of the rectum was discovered, with partial obstruction of the bowel. Because of the unfavorable response to roentgen-ray treatment, a course of nitrogen mustard was administered intravenously. The patient died at home in the spring of 1953.

Comment on Case 4.—In 1949 Waller and Shullenberger[6] reviewed twenty-one cases of primary lymphosarcoma of the prostate gland reported in the literature, and added one new case. The age of the patients reported ranged from twenty-two to sixty-eight years, and the average age was forty-one years. The authors wrote that lymphosarcoma of the prostate gland should be considered when a large tumor of that structure occurs which is not hard or nodular, and when the patient is middle-aged. Sarcoma of the prostate gland, on the other hand, is a disease of children.

Comment and Summary

Four cases of lymphosarcoma have been reported in which the initial manifestations presented themselves in extranodal sites. The occurrence of the process in such sites probably is more frequent than is true of Hodgkin's disease. The organs or structures primarily involved were: (1) an extra-ocular muscle, (2) the frontal bone of the head, (3) the left lung, and (4) the prostate gland. Difficulty in diagnosis arises when there is neither superficial lymphadenopathy nor definite evidence of enlargement of more deeply seated

(Continued on Page 158)

Now Available

7 Years Sickness Benefits

(HOUSE CONFINEMENT NOT REQUIRED)

Lifetime Accident Benefits

This extension of benefits is now available to you as a member of the Minnesota State Medical Association. Since December, *1947*, the inception date of our plan for members of your Association, the Caswell-Ross Agency has attempted at all times to secure for you the finest coverage in the accident and sickness field. These improvements will make your policy the best among many available to you. An application has been sent to you previously—why not complete and return it to our office now.

CASWELL-ROSS AGENCY

1177 N. W. Bank Building
Minneapolis 2, Minnesota
Minneapolis—FE 2-2585
St. Paul—MI. 5-7004

Administrators of Professional Disability Plans

Minnesota State Bar Association
Minnesota State Dental Association
Minnesota State Medical Association
Minnesota Society of C. P. A.
Minnesota State Pharmaceutical Assn.
Minnesota Auto Dealers Association
Minnesota Federation of Eng. Societies
Minnesota State Veterinary Medical Soc.
Hennepin County Medical Society
Hennepin County Bar Association
11th Judicial Bar Association
Minneapolis Association of Life Underwriters
Minnesota State Life Underwriters Assn., Inc.
Ramsey County Medical Society
Ramsey County Bar Association
St. Paul District Dental Soc.
Minneapolis District Dental Soc.
St. Cloud Dental and Stearns County Medical Society
Duluth District Dental Society
East Central Medical Society
St. Louis County Medical Society
West Central Dist. Dental Society
Northwest Proprietors Association
St. Paul Life Underwriters, Inc.

PHOTO DATA. CAMERA: 4X5 VIEW CAMERA; EXPOSURE: 1/25 SEC. AT F.11 EXISTING LIGHTING.

ACHROMYCIN*

Tetracycline *Lederle*

widely prescribed because of these important advantages:

1) rapid diffusion and penetration

2) prompt control of infection

3) true broad-spectrum activity (proved effective against a wide variety of infections caused by Gram-positive a Gram-negative bacteria, rickettsiae, a certain viruses and protozoa)

4) negligible side effects

5) every gram produced in Lederle's *ow* laboratories under rigid quality contr and offered *only* under the Lederle la

6) a *complete* line of dosage forms

in prolonged illness, prescribe

ACHROMYCIN SF

TETRACYCLINE with STRESS FORMULA VITAMINS

Attacks the infection, bolsters the body's natural defense. Stress vitamin formula suggested by the National Research Council in *dry-filled, sealed* capsules with ACHROMYCIN, 250 mg. Also available: ACHROMYCIN SF ORAL SUSPENSION (Cherry Flavor), 125 mg. per 5 cc. plus vitamins.

dry- filled sealed capsules

(a Lederle exclusive!) for more rapid and complete absorption. No oils, no paste, tamperproof!

LEDERLE LABORATORIES DIVISION *AMERICAN Cyanamid COMPANY* PEARL RIVER, NEW YORK Lederle

*REG. U. S. PAT. OFF.

ANNOUNCING

for psychosomatic-equanimity...

'TWINMINN'*

TABLETS

"neither a bromide nor a barbiturate"

Each scored tablet contains:
in a special modified slow disintegrating base

MEPHENESIN IMPROVED (CANFIELD) 3-Ortho-toloxy-1, 2-propanediol	Gr. 4
BROMISOVALUM (Alpha mono-brom-iso-valeryl carbamide)	Gr. 2½
UREA (Carbamide)	Gr. 1

new balanced anti-anxiety factors with muscle-relaxing properties relieves tension

excellent tolerance—during reaction and absorption in stomach

Manufactured in U.S.A. for

C. R. CANFIELD & CO.
2736-38 Lyndale Avenue South
Minneapolis 8, Minnesota

Directions: One or two tablets every three to four hours.

Supplied: Tablets, 7½ Grains, bottles of 100, 500 & 1000.

* Trademark

Treatment of Severe Injuries of the Hand

LESTER W. CARLANDER, M.D.
Minneapolis, Minnesota

THE great importance of the functional capacity of the hand to the skilled craftsman, the artist or musician, the physician and surgeon, is of course apparent to everyone. We must, however, not overlook the fact that a serious injury to the hand with resultant crippling may be equally disastrous to the laborer, the farmer, the housewife; indeed a handicap to anyone. The miraculous capacity of the human hand was the text of an article in a recent lay magazine entitled "Your Hands are Incredible." In this article, John Pfeiffer points out the following facts about the dexterity of our hands:

1. The pianist, Paderewski, playing at top speed, struck 120 notes a second, varying the rhythm and striking force with amazing control.
2. It is estimated that the five fingers in combination can assume any one of 300 million possible useful positions.
3. About one-third of the 5 million tiny cutaneous sense organs of the entire body are located in the hands.
4. During World War II, blind workers using touch alone actually did a surprisingly superior job of sorting precise machine parts for radar equipment than sighted workers using micrometer gauges.
5. It is, of course, the capacity for the human thumb to rotate into position of opposition that separates the homo sapiens from the higher apes.

The human hand has been described as an organ of grasp, an organ of sensation, and an organ of expression. All injuries of the hand, from the time they are first seen, should be treated with the purpose in mind of restoring this high degree of functional capacity. With this emphasis on early restoration of function, there are a few general principles that are worthy of mention.

General Considerations

1. Early closure and coverage of wounds. The scarring and fibrosis that accompanies delayed healing and open wounds results in stiffness and loss of function in the hand.
2. Treat swelling from the first. This is particularly true in crushing types of injury where swelling may be severe. Prolonged swelling restricts interphalangeal motion and is accompanied by fibrotic changes in the capsules of the metacarpal-phalangeal and interphalangeal articulations. Treatment of swelling may include constant elevation, compressive type dressings, and stellate ganglion blocks.
3. Immobilize only the portion of the hand that is necessary and this should be immobilized in functional position (partial flexion of the metacarpal-phalangeal and interphalangeal joints).
4. Early mobilization of the hand. Active and passive motion should be started as soon as consistent with the healing of the injuries, often before complete bony healing is accomplished.
5. The main responsibility of the doctor first treating an injured hand is proper treatment of the wound. The importance of obtaining uninfected and rapid healing cannot be over-emphasized and should be the main objective of the emergency treatment.

Major injuries to the hand, as occasionally seen from punch presses and frequently seen with corn picker injuries on the farm, may involve loss of some of the component parts of the hands. Viable and possibly viable tissue in general should be preserved. This is particularly true with regard to the thumb and with sole remaining portions of fingers opposed to the thumb. It is important in dressing these injuries to maintain the thumb and first metacarpal in position of opposition so as to avoid contraction of the web and inability to oppose the thumb to the remaining hand. Care may include early skin grafting in order to prevent undue sacrifice of remaining skeletal parts. Rehabilitation may include use of prosthetic appliances or occasionally transposition of finger to replace the thumb.

Severe injuries to the hand may often combine damages to the skeletal and soft parts. Judicious use of primary amputation may be indicated where

---

Read at the annual meeting of the Minnesota State Medical Association, Minneapolis, May 25, 1955.

damage to the metacarpal-phalangeal or proximal interphalangeal joints makes return of function impossible, or where the traumatic amputation leaves an ineffective stump. This should be done only when some of the remaining digits are intact and at times may be preferable to long periods of disability and consequent economic loss.

In cases where there is combination of fractures in phalanges and metacarpals associated with tendon injuries, it is often best to obtain stabilization and healing of the bony components and passively mobile joints before attempting repair of the tendon injury. Repairing all components primarily may leave too long a period after repair before rehabilitation can be started, resulting in binding down of the tendons and diffuse stiffness of the hand. The use of fine Kirschner wires to immobilize fractures may allow resumption of motion before complete bony healing of the fracture is accomplished.

Tendon and Nerve Injuries

The difference in the results in repair of extensors tendons from that of repair of flexor tendons has long been apparent to all. Extensor tendons for the most part are single tendons and do not slide in sheaths. Their motion back and forth is possible because of the long fiber type of areolar tissue about them. Repair usually consists simply of approximation by suture, and splinting of the wrist and fingers so as to relax all tension on the anastomosis. Repair of flexor tendons on the other hand, is not only technically more difficult but also prone to give much poorer results. This is particularly true in the region of the hand extending from the distal palmar crease to the proximal interphalangeal joint. In this area primary repair of flexor tendons has an extremely poor prognosis. For this reason, Dr. Sterling Bunnell has labelled this area "no man's land." In a recent review of some 500 tendon injuries in the hand, Dr. M. F. Hauge[1] presented some interesting facts. The seriousness of flexor tendon injuries in "no man's land" is attested to by the results of ninety-eight primary tendon sutures in this area, in which Dr. Hauge also included the thumb. There was one successful suture (in the thumb) and three fairly satisfactory results (two in the thumb) and ninety-four failures. When we look to see what is unique about this area of the hand anatomically, we find, of course, that in this region both the flexor sublimis and flexor profundus tendons run together through a very tight reinforced portion of the tendon sheaths. Tendons injured and repaired in this area tend to bind down during the process of healing, subsequently do not slide normally, and finally flexion is accomplished, usually limited to the metacarpal-phalangeal articulation. For this reason, it is becoming more and more generally believed that lacerations of the flexor tendons in this portion of the hand are best treated primarily by simple cleaning of the wound, closure of the wound, obtaining flexible joints by early passive motion, and then subsequent removal of the flexor sublimis tendon and replacing the flexor profundus tendon by free tendon graft.

A second serious special injury presenting difficulty of technical repair is the injury of the median nerve at the base of the thenar eminence. As the median nerve emerges in this area, it branches into sensory branches to one-half the ring finger, to the middle finger, the index finger, and the thumb, and sweeps back into the thenar eminence with motor branches to the opponens, short abductor and one head of the short flexor muscles. The anatomy is intricate when intact and, when altered by trauma, can be difficult for any of us.

As we have mentioned in the presence of extensive soft tissue and skeletal injuries it may be better to close these wounds, to get good healing and pliable joints, and to plan on secondarily accomplishing tendon or nerve repairs or grafts, rather than to attempt multiple primary tendon and nerve repairs.

Dr. Joseph H. Boyes, past president of the American Society of Hand Surgery, has stated that there are three components to the trade of any skilled craftsman: materials, principles, and techniques.

As craftsmen in the repair of the injured hands, the "material" with which one works is the anatomy of the hand: the bones, the joints, the muscles and tendons and their sheaths, the nerves and the blood vessels, and the skin. These are the lumber, the metals, and the paints with which we must be familiar to accomplish good work.

The principles involved in hand surgery are represented by the knowledge and judgment of what should be done with each of the various types of injuries which we see in order to assure return of function.

It is our technique in dealing with this material and applying these principles that to a great extent

(Continued on Page 164)

The Use of Liquid Oxygen in Dermatology

CARL W. LAYMON, M.D., and
CHARLES J. BALOGH, M.D.
Minneapolis, Minnesota

LIQUID oxygen was used for the treatment of cutaneous diseases in Minneapolis by Irvine and Turnacliff,[1] who reported their findings in 1929. For the next two decades little attention was paid to this modality in the Upper Midwest. We became interested in the use of liquid oxygen several years ago following discussions with Dr. Ashton L. Welsh of Cincinnati. Kile and Welsh (1948) reported their results in the treatment of more than 1,000 patients with disorders of the skin. They observed that liquid oxygen was an effective local destructive agent in patients having warts, hemangiomas, keratoses, or leukoplakia.

A. C. White (1899)[2] reported originally on the use of liquid oxygen by dermatologists. Following Pusey's[3] paper concerning the dermatologic uses of solid carbon dioxide, liquid oxygen went into eclipse. It was due largely to the reports of Kile and Welsh (1948)[4] and Allington (1950)[5] that interest in the use of liquid gases as cryotherapeutic agents in dermatology has been stimulated. In a paper (in press) presented recently (April, 1955) before the American Dermatological Association, Dr. A. Fletcher Hall, of Santa Monica, California, voiced his enthusiasm concerning the use of gaseous refrigerating agents in the treatment of selected cutaneous disorders.

Allington stated that in recent years the commercial demand for oxygen and nitrogen has led to the production of these elements in almost pure form and in large quantities. The process of manufacture includes the compression and the refrigeration of atmospheric air and then its fractional distillation and chemical rectification. Liquid oxygen boils at —297° F. (—183° C.) at atmospheric pressure. The sublimation point of carbon dioxide is —110.3° F. (—78.5° C.) For a time, liquid oxygen was more easily obtained than liquid nitrogen. When the latter became more commonly available, some workers preferred it because it had the advantage of being largely inert and presented less of a fire hazard than liquid oxygen. Since liquid oxygen is combustible, contact with fire should be avoided, but it is entirely safe to use if reasonable care is taken. Liquid nitrogen is 13° C. colder than liquid oxygen, hence evaporation is more rapid. Because liquid oxygen is delivered to our office daily from Monday through Friday, this is of little practical importance. The material can be transported from the manufacturer in an ordinary thermos bottle carried in a cardboard carton. The use of a Stanley all-steel vacuum bottle obviates breakage and the use of the cardboard container. Kile and Welsh stated that they obtained one liter of liquid oxygen weekly. In our experience this quantity of liquid oxygen evaporates within twenty-four to thirty-six hours, especially during the warm months of summer. For this reason we decided on a daily delivery so that the oxygen would be available when occasion demanded.

Liquid oxygen is applied by means of an ordinary cotton swab or cotton wrapped around a wooden applicator. The latter is dipped into the liquid and applied to the lesion to be treated. The amount of pressure varies according to the depth of the growth, but only slight to moderate pressure is required in most instances since freezing is almost instantaneous. Lesions such as verrucae on the palmar or plantar surfaces require several seconds to become frozen to their complete depth. The area which is being treated turns white rapidly because of the extreme coldness of the liquid oxygen. Pain varies according to the size and depth of the lesion. Shortly after the initial application of the fluid, after the area is blanched, there is little discomfort. As thawing occurs there is an increase in pain which may last for several hours. Mild analgesics are helpful. After lesions have been treated with liquid oxygen, redness and swelling develop within a short time. In a few hours a bulla forms, which

---

From the Department of Dermatology, Minneapolis General Hospital, Carl W. Laymon, M.D., director; and the Division of Dermatology, University of Minnesota, H. E. Michelson, M.D., director.

reaches its height within two or three days. Sometimes the lesion is hemorrhagic, and patients should be warned that this is no cause for alarm. It has been our custom to instruct patients to return in one week, at which time the roof of the bulla is removed, and the lesion dressed. Healing takes place within two to four weeks, depending upon the size and thickness of the lesion. The development of scars is rare, but when they occur, they are soft, thin, and inconspicuous. Keloids occur rarely, if ever. Repeated treatments are necessary occasionally. We have used liquid oxygen mainly in the treatment of verrucae of various types. In our opinion it is the best way to treat plantar warts of the mosaic type.

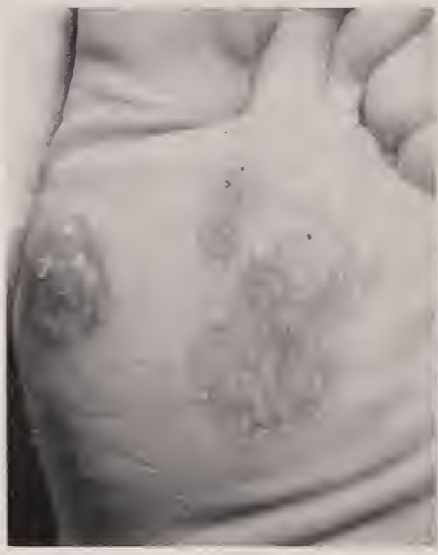


Fig. 1. Bullae one week following the application of liquid oxygen.

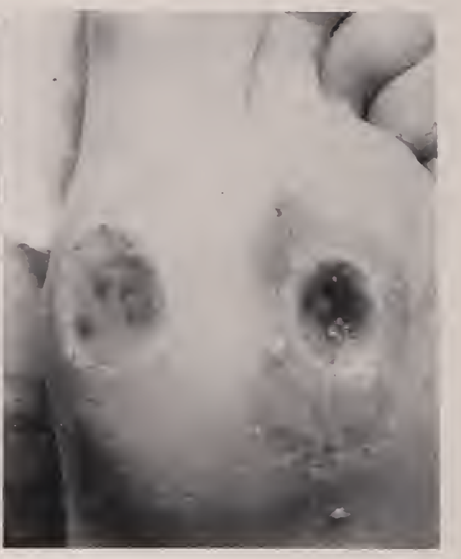


Fig. 2. Appearance of the skin immediately following the trimming of the bullae with small scissors.

Although we have employed liquid oxygen over a period of several years, we have surveyed our statistics only since 1953. Table I is self-explanatory.

In the past two years we have also treated thirty-four cases of hemangioma simplex. In twenty-five the result was considered to be satisfactory. Nine patients failed to return for observation.

It is our impression that liquid oxygen is of definite value in the topical treatment of chronic discoid lupus erythematosus.

We have used this agent in sixteen cases of keloid. In ten an excellent result was obtained, in two satisfactory improvement, in one no improvement, and three patients failed to return for observation.

We have not attempted to use liquid gases in the treatment of leukoplakia which was satisfactorily treated by Kile and Welsh with liquid oxygen and by Allington with liquid nitrogen. Furthermore, we have had no experience in the treatment of dermatitis venenata such as can be produced by various plants.

TABLE I. VERRUCAE TREATED BY MEANS OF LIQUID OXYGEN

	Satisfactory Results	Failures	Failed to Return	Total Cases
Verruca Vulgaris	92	8	39	139
	66%	6%	28%	
Verruca Plana	5	2	3	10
	50%	20%	30%	
Verruca Plantaris	84	11	30	125
(including mosaic type)	67%	9%	24%	
Total	181	21	72	274
	65%	8%	27%	

As aforementioned, our study has been devoted chiefly to verrucae. The latter are extremely capricious in their course, and the results of any treatment are almost unpredictable. Destructive measures such as electrocauterization and electrodesiccation are curative in many cases and x-rays are valuable in others. We believe that liquid oxygen is an excellent addition to our armamentarium for the treatment of warts and

(Continued on Page 158)

Problems in the Clinical Diagnosis and Classification of Ventricular Hypertrophy in Adults

III. Familial Cardiopathy

BEN SOMMERS, M.D.
Saint Paul, Minnesota

THE THIRD and final paper in this series of three presentations concerned with problems in ventricular hypertrophy deals with three cases, all in one family, of the entity termed “familial cardiomegaly” by Evans.[1]

Report of Cases

Case 1.—A twenty-three-year-old white woman was hospitalized in May, 1930, because of shortness of breath on exertion. One week prior to admission, she had attended a picnic, following which abdominal pain, nausea, vomiting, and slight fever had developed. Three days before admission, rather marked fatigability and dyspnea on exertion began.

The blood pressure was 86/70. The skin and mucous membranes appeared paler than normal but cyanosis was not present. A gallop rhythm was described, with a pulse rate of 110 beats per minute. A low-grade fever lasted for one week.

The hemoglobin was 76 per cent (Sahli). Erythrocytes numbered 4,340,000 and the leukocyte count varied from 10,150 on admission to 15,750 on the fourth day of hospitalization. The differential count was not remarkable.

Electrocardiograms showed sinus tachycardia (rate 105-90), slight slurring of the QRS complexes and changes in the T waves. On May 12, the T waves in leads II and III were negative and those in lead I were flattened. The PR interval was 0.18 second. Ten days after the first tracing, the T waves in all three standard leads were reported to be negative. (These data were available on microfilm but the electrocardiograms themselves had not been photographed). The PR interval was 0.20 second, with a heart rate of 102. The patient was dismissed in June as improved, but she was admitted again in July, 1930, because of abdominal pain, bloating and vomiting. She was dyspneic on examination, and the pulse was weak and fast (125). On July 18, cyanosis, hemoptysis and increasing dyspnea required digitalization and use of an oxygen tent. Death occurred on that date.

Necropsy was done by Dr. Kano Ikeda. The heart weighed 400 gm. Moderate hypertrophy of both right and left ventricles was present, with great dilatation of all the chambers. The valves were normal. The circumferences of the valves were as follows: tricuspid, 14 cm.; mitral, 11 cm.; pulmonary, 7 cm.; aortic, 5 cm. The right auricular appendage contained a small mural thrombus and a larger one was present in the left ventricle. The mural endocardium was smooth, except for a small area of grayish thickening in the left ventricle. The coronary arteries were normal. The aortic arch was reduced in diameter, as were the great vessels arising from it.

Microscopic sections of the myocardium were normal, except for swelling and edema in a few areas. The mural endocardium showed slight fibrous thickening; one area in one section showed subendocardial infiltration of monocytes and lymphocytes.

The anatomic diagnoses included cardiac hypertrophy and dilatation, hypoplasia of the aorta and arterial trunks, thrombus of the right auricle and left ventricle, infarct of the right lung with embolism of the pulmonary artery, chronic passive congestion of the organs, pleural effusion, pericardial effusion, and ascites.

Case 2.—A 26-year-old physician, a younger brother of the patient just described, was hospitalized in February, 1936, and died in the hospital on April 8, 1936. Two weeks before admission, he had a severe cold, with a nocturnal cough. Dyspnea began gradually. On the night before admission severe substernal pain began, accompanied by blood-streaked sputum.

His past health had been excellent, except for three episodes of pneumonia in 1915, 1916 and 1920.

Temperature was 100.4°F., pulse rate was 136, and blood pressure was 90/70. Pallor was noted. There was some injection of the pharynx. Many moist râles were elicited at both lung bases, and there was evidence of fluid at the right base. The pulse was described as rapid, weak and of poor volume. The heart was generally enlarged to the right and left. The sounds were all of poor quality, and a pulse deficit of 30 beats per minute was noted. A short presystolic murmur at the apex was present, with some accentuation of the second sound at the apex; the pulmonic second sound was accentuated. The liver was slightly enlarged, but the spleen was not palpable. No edema of the extremities was present on admission.

The patient was placed on the usual “cardiac routine” and remained in bed for three weeks with some improvement. He was then allowed up but it was seen

---

From the Charles T. Miller Hospital, Saint Paul, and the University of Minnesota, Minneapolis, Minnesota.

Part III of this is submitted for admission to the Minnesota Academy of Medicine, April, 1954.

at once that there was a return of orthopnea and dyspnea, and he was put back to bed. Digitalis appeared to help but little. His pulse rate was continually fast, and a gradual increase in the size of the liver was noted. On March 30, he suddenly became worse, with increase in dyspnea and orthopnea, elevation of temperature, and beginning edema of the sacral region. He was placed in an oxygen tent but grew worse and died suddenly two months after onset of symptoms. Laboratory studies were noncontributory.

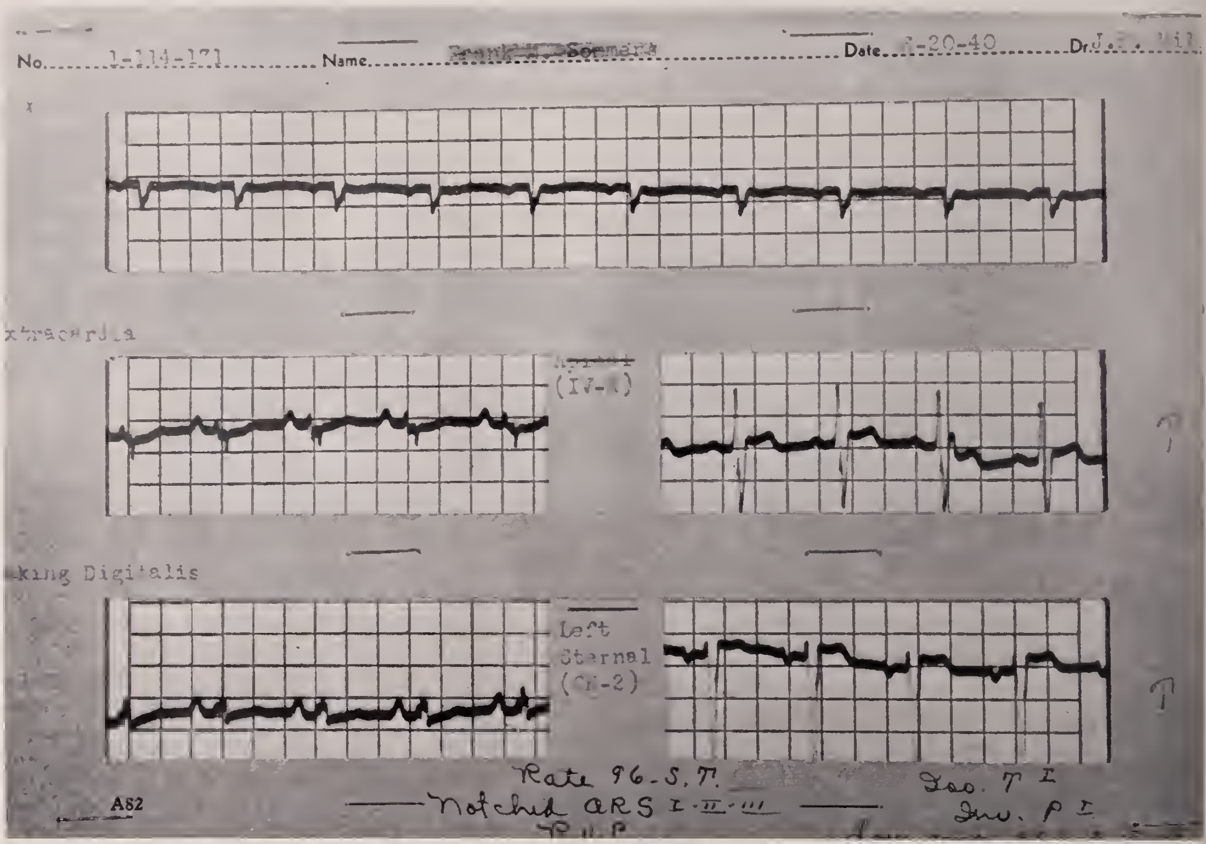


Fig. 1 (Case 3). Electrocardiogram in a twenty-five-year-old man with familial cardiopathy and situs inversus.

Necropsy was done by Drs. Wilson and Blackman. The heart weighed 520 gm. The form was rounded due to apparent increase in size of both the right and left ventricle. The epicardium was normal. All the valves were delicate in appearance and competent. The myocardium was everywhere free of scarring except for a small area beneath a large thrombus of the endocardium of the left ventricle. The coronary arteries were normal.

Microscopic sections were made from every possible portion of the heart and all of them showed essentially the same picture. There was widespread scarring throughout the myocardium without any particular distribution of the scars in relation to arteries. They ranged in size from minute scars involving small portions of muscle bundles to large scars involving several muscle bundles. The muscle fibers in such regions were replaced by pale, pink-staining, rather homogeneous fibrous tissue without inflammatory cells. In other places, a definite chronic inflammatory process was present. In numerous locations beneath the endocardium and in some zones deeper in the wall of the left ventricle, there were groups of lymphocytes and polymorphonuclear leukocytes arranged in thin layers and strands. Some of these had a perivascular distribution.

The anatomic diagnoses included diffuse progressive scarring of the myocardium (idiopathic progressive myocarditis), cardiac hypertrophy and dilatation, mural thrombi in right and left ventricles, chronic passive congestion of organs, infarcts in lungs, spleen and kidney, jaundice, anasarca and diphtheritic esophagitis.

Case 3.—A twenty-five-year-old man, a younger brother of the two patients just described, died of cardiac failure in August, 1940. This patient was hospitalized before death on two occasions, once in March and again in August, 1940. Shortness of breath began one week prior to the first admission and two weeks after onset of a cold with sore throat. Except for a chronic sinus infection, his past health always had been good. He had known since physical examinations for entrance to college that he had complete situs inversus.

The pharynx was reddened and the nasal mucous membrane was injected. Numerous moist râles were elicited over the bases of both lungs posteriorly. The heart was regular in rate and rhythm, and there were no murmurs. The apex beat was on the right side. The blood pressure was 96/74. The liver border was palpable a half finger below the costal margin. Edema of the extremities was absent.

Results of laboratory studies were normal except for a leukocyte count of 17,000, gradually decreasing to 10,880.

A 6-foot film of the thorax showed a slightly enlarged heart, with a cardiothoracic ratio of 49.6 per cent, and complete situs inversus.

Gradual improvement occurred and the patient was sent home on a very restricted regimen. In July, 1940, he was taken to the Mayo Clinic, where Dr. Frederick A. Willius examined him. The electrocardiogram obtained there was loaned for reproduction (Fig. 1). No definite diagnosis was possible, except for dextrocardia and complete situs inversus. Dr. Max Hoffman, physician in charge of this patient, believed that the electrocardiographic changes and the clinical course were suggestive of myocarditis, similar to the condition in the older brother (Case 2).

The second admission to the hospital was necessitated by a great increase in nocturnal dyspnea. Definite cyanosis was seen on admission. Numerous moist rales were again heard, and slight edema was now present.

Results of laboratory studies were much the same, with moderate leukocytosis. The electrocardiogram was reported as showing a 3:1 auricular flutter.

Marked cyanosis and dyspnea required venesection and oxygen, and the patient seemed in imminent danger of death. Gradual improvement occurred, but sudden death took place three days after dismissal from the hospital.

Necropsy was done by Dr. Kano Ikeda. The heart with the pericardium open measured 17 cm. in transverse diameter. It occupied the right side of the thoracic cavity, its apex pointing to the right. There was complete transposition of the heart and great vessels. The heart, together with the ascending portion of the arch, weighed 560 gm. The epicardium was smooth. The myocardium was unremarkable in color or consistency. The left ventricle was 2 cm. in thickness and the right ventricle was 9 mm. A large thrombus was attached to the mural lining of the right and left ventricles near the apices, and one was present in the right auricular appendix. All the chambers were greatly dilated. The mitral orifice measured 12 cm. in circumference, the tricuspid, 14 cm., the pulmonary, 6 cm. and the aortic ring, 5 cm. The aortic arch was greatly reduced in size and considerably shortened. The coronary arteries were normal.

Microscopic sections of the myocardium were entirely normal, except for two fields. One of these showed only a few lymphocytes. The second small field showed a rather severe acute myocarditis involving both the interstitial tissue and also the muscle fibers. Dr. Otto Saphir kindly reviewed these sections and stated that if no other disease were found at necropsy that could possibly account for the myocarditis as a complication, he would believe that this was an instance of isolated myocarditis.

The anatomic diagnoses included dextrocardia and complete situs inversus, hypoplasia of the aorta, cardiac hypertrophy and dilatation, mural thrombosis of the left ventricle and of the right auricle and ventricle, chronic passive congestion of the organs, embolism of the left lower trunk of the pulmonary artery, infarct of the left kidney, an anomalous artery at the lower pole of the left kidney and an azygos lobe of the left lung.

Comment

An older brother and a sister, fifty and forty years of age, respectively, at the time this is written, are living and well. The mother died suddenly of a cerebrovascular accident at the age of seventy. The father is eighty-four years of age. In December, 1954, he successfully underwent removal of a chondroma of the mediastinum; this arose from a rib and weighed 5 pounds. Family records reveal no other similar cardiac conditions.

These two brothers and the sister were of a similar body build, varying in weight from 120 (Case 1) to 150 (Case 3) pounds, and from 65 to 67 inches in height, respectively. All had taken active part in athletics during high-school and college days, and appeared to be in excellent health just prior to the onset of their fatal illnesses.

These three unusual cases present a problem in diagnosis and classification. The diagnosis of hypoplasia of the aorta made in Cases 1 and 3 now has been abandoned. Myocarditis was present in Cases 2 and 3 but was not demonstrated in Case 1. The possibility remains that more sections of the myocardium in the latter case might have shown areas of focal myocarditis. Unfortunately, none of the hearts is now available.

It is difficult to avoid the conclusion that some unknown familial myocardial disease was present in each case. The similar clinical course, attacking at a similar age (twenty-three, twenty-six and twenty-five years), lends support to this viewpoint. The presence of complete situs inversus in Case 3 and of a chondroma in the father suggests what Dr. Willius, in a letter to Dr. Hoffman, called "the vicious portrayal of the relentless forces of heredity."

Evans,[1] in a paper entitled "Familial Cardiomegaly," described three cases in one family, and possibly three more unproved ones, with cardiac hypertrophy. Bundle-branch block was present in two, and tachycardia was a frequent occurrence. At necropsy, marked myocardial fibrosis was present in all three. Evans believed his cases might have been related to Friedreich's disease. The cardiac manifestations in Friedreich's ataxia are described in detail by Schilero and associates.[2] Myocardial fibrosis was the commonest finding, and infiltration with lymphocytes and eosinophils was also noted. Occasionally, pericardial effusion, complete heart block, bundle-branch block, valvular involvement as in rheumatic fever, and coronary sclerosis were present. The findings in Evans' three cases and in Cases 2 and 3 of this report are pathologically consistent with the cardiac manifestations in Friedreich's disease.

In the case records of the Massachusetts General Hospital,[3] Case 28042 is that of a man who died at twenty-nine years of age with idiopathic cardiac hypertrophy. His sister and possibly one brother were thought to have the same condition. Complete heart block was present in this case and in the sister. The heart weighed 600 gm. and exhibited enormous dilatation of all the chambers. Aside from hypertrophy, the muscle fibers were normal on microscopic study. A mural thrombus was present in the left auricular appendage. This case resembles Cases 1 and 3 of the present report. Dr. Paul White's comment was pertinent to this discussion. He said, "Each year, at the time of our graduate courses, we try to present one such case as this. It is not only very humbling, but it is also stimulating to our own further studies."

Summary and Conclusions

Three cases of familial cardiopathy are reported. Complete situs inversus was present in one instance. Myocarditis was present in two of these cases but the myocardium in the first case appeared normal. It is postulated that the same familial disease was present in all three cases. Friedreich's disease without the neurologic involvement is a possibility.

Acknowledgments

This series of papers could not have been written without the help of a number of physicians. For permissions and various clinical and pathologic data, I am grateful to Drs. J. Meade, P. Soucheray, E. T. Hermann, J. W. Jesion, C. W. Waas, A. D. Pollack, and G. Mirick. Dr. Kano Ikeda restudied various cases with me and personally prepared all the photomicrographs. Drs. B. J. Clawson and G. E. Fahr gave me valuable advice in the preparation of the manuscript. Dr. O. Saphir restudied the sections in one case. I am deeply grateful to Dr. J. E. Edwards, without whose help this manuscript could not have been written.

References

1. Evans, William: Familial cardiomegaly. Brit. Heart J., 11:68, 1949.
2. Schilero, A. J., Antzis, E., and Dunn, James: Friedreich's ataxia and its cardiac manifestations. Am. Heart J., 44:805, 1952.
3. Massachusetts General Hospital: Case Records—Case 28042. New England J. Med., 226:158, 1942.

LARYNGOCELE

(Continued from Page 140)

12. Moore, I.: The so-called prolapse of the laryngeal ventricle and eversion of the sacculus. J. Laryng. & Otol., 37:265, 333 and 381, 1922.
13. Lindsay, J. R.: Laryngocele ventricularis. Ann. Otol., Rhin. & Laryngol., 49:661-673, 1940.
14. Allman, C. H., and Cordray, D. P.: Laryngocele. Ann. Otol., Rhin. & Laryngol., 51:586-591, 1942.
15. Jackson, C. L.: Laryngocele. Laryngoscope, 57:788-795 (Dec.) 1947.
16. McLaurin, J. W.: Laryngocele—report of a case. Laryngoscope, 57:616-622 (Sept.) 1947.
17. Harrison, K., and Lawson, H. P.: Laryngoceles in the human. Proc. Roy. Soc. Med., 43:660-663 (Aug.) 1950.
18. Butler, H.: Bilateral external laryngocele ventricularis. J. Laryng. & Otol., 64:625-631 (Oct.) 1950.
19. Horowitz, S.: Laryngoceles. J. Laryng. & Otol., 65:724-734 (Oct.) 1951.
20. Black, J. I. Munro: A cyst of the laryngeal ventricle. J. Laryng. & Otol., 65:735 (Oct.) 1951.
21. O'Keefe, John J.: Laryngocele. Arch. Otol., 54:29-33, 1951.
22. Keim, W. J., and Livingstone, R. G.: Internal laryngocele. Ann. Otol., Rhin. & Laryngol., 60:39-50 (Mar.) 1951.
23. Hoover, W. B.: Laryngocele, report of two cases and discussion of surgical treatment. S. Clin. North America (June) 1952, Lahey Clinic Number.
24. Meda, P.: Symptomatic laryngocele in cancer of the larynx. Arch. Otol., 56:512-520, 1952.
25. Hill, M. R., and Kipen, C. S.: Laryngocele: an unusual tumor of the neck. Surgery, 35:273-276 (Feb.) 1954.
26. Mays, C. A.: A case of fatal asphyxia due to infection of a ventricular laryngocele. Brit. J. Surg., 41:662-663 (May) 1954.

Trichinosis, a Declining Infection

FRANKLIN G. WALLACE, Ph.D.,
and ARTHUR J. SANDERS
Minneapolis, Minnesota

A SURVEY was conducted from June 17, 1952, to November 7, 1954, at the Minneapolis Veterans Hospital to determine the incidence of nfection with *Trichinella spiralis*. Portions of diaphragms from 100 autopsies were examined by he compression and digestion methods.

Except for the exclusion of five cases known to have died of tuberculosis, the cases examined for Trichinella were taken at random among the autopsies performed at the hospital, the choice of cases depending only on the authors' work chedule.

Riley and Scheifley[1] in Minneapolis conducted one of the first surveys of Trichinella incidence. Using the compression method they found twenty of 117 cases (17.1 per cent) infected. Scheifley[2] ound fifteen of 118 cases (12.7 per cent) infected n the same city. Numerous surveys in the United States between 1931 and 1942 reveal an incidence of approximately 16 per cent.[3] In San Francisco[4] an incidence of 8 per cent was found in the same city and using the same methods as fifteen years before[5] when 24 per cent were found infected. No statistically significant difference in the composition of the two samples could be shown.

Materials and Methods

Samples of muscular diaphragm were removed by the pathologist. Approximately 90 per cent of he specimens examined weighed between 70 and 80 grams. One sample weighed only 50 grams and the heaviest weighed 165 grams.

One gram of each sample was used for compression examination. Thin portions of teased muscle were compressed between two glass plates and examined for *Trichinella spiralis* larvae under a dissecting microscope or the low power of a compound microscope. The glass plates were held in place between two rectangular brass frames 3½ by 5 cm., and compression was applied by means of two thumb screws. The remainder of the specimen was ground up in a standard household meat chopper. The ground muscle was digested with freshly prepared artificial gastric juice in a 37° C. water bath for a minimum of twenty-four hours with occasional shaking. The artificial gastric juice consisted of 1 per cent pepsin and .25N HCL solution. The suspension was then strained through gauze into a separatory funnel and allowed to stand for a minimum of two hours. Ten ml. of sediment were diluted with distilled water, transferred to a petri dish and examined for *Trichinella spiralis* larvae. Microscopic examinations were done with a stereoscopic dissecting microscope with a magnification of 54 or with a binocular compound microscope using a magnification of 50.

Infected rat muscle was processed on two occasions to verify the effectiveness of the technique.

Results

Of the 100 subjects studied, there was one female and ninety-nine males, one negro and ninety-nine white. Eighty-nine were native-born Americans; the eleven foreign-born came from Austria (one), Canada (one), Finland (two), Germany (two), Norway (two), Russia (one), Scotland (one), and Sweden (one). There was one Jew, nineteen Catholics, and eighty Protestants. Seventy-six were residents of Minnesota, thirteen came from adjoining states, and one from Florida. Eight were farmers, while ninety-two were nonfarm workers or retired.

The age distribution was as follows:

20-29	8
30-39	6
40-49	5
50-59	36
60-69	38
70 and over	7

The two positive cases were males in the 60-69 age group, were nonfarm workers and white, na-

---

From the Department of Zoology, University of Minnesota and the Clinical Laboratory, Veterans Administraion Hospital, Minneapolis.

Dr. Wallace is Associate Professor of Zoology, University of Minnesota, attending in Parasitology at the Veterans Hospital, and Mr. Sanders is Parasitologist at he Veterans Hospital.

tive born residents of Minnesota. One was Catholic and one Protestant.

Discussion

While the earlier surveys in Minneapolis gave no information on the composition of their samples relative to age, race, religion, et cetera, we conclude that there has been a real decrease in incidence in this area. The difference between the present results and those of Riley and Scheifley[1] is more than five times the standard error, and between present results and those of Scheifley[2] is more than four times the standard error.

Such a marked decrease in the incidence of trichinosis is likely to be attributed to the recently enacted laws (Chap. 355, Minn. Laws 1953, and other laws in neighboring states in the same year) which require the cooking of garbage fed to hogs. It should be pointed out that the present survey was already half completed on July 1, 1953, when the Minnesota law went into effect, and continued for sixteen months thereafter. Trichinella cysts remain alive, or at least visible, for so long in man (variously recorded as thirteen, twenty-four, and thirty-one years by Gould) that the influence of a factor reducing the incidence of the parasite would become evident only after some years. Beard[5] finds that there has been a marked decrease in Trichinella infection in San Francisco in recent years. We believe that there was a marked reduction in Trichinella infection in Minnesota before the garbage cooking law went into effect.

References

1. Riley, W. A., and Scheifley, C. H.: Trichinosis of man a common infection. J.A.M.A., 102:1217-1218, 1934.
2. Scheifley, C. H.: The prevalence of trichinosis. Am. J. Hyg., 27:142-148, 1938.
3. Gould, S. E.: Trichinosis. P. 56. Springfield, Ill.: Charles C Thomas, 1945.
4. Beard, R. R.: Incidence of trichinella infections in San Francisco. 1950. J.A.M.A., 146:331-334, 1951.
5. McNaught, J. B., and Anderson, E. V.: The incidence of trichinosis in San Francisco. J.A.M.A., 107:1446-1448, 1936.

LYMPHOSARCOMA

(Continued from Page 148)

nodes.[7] As is true of all the lymphomas, the diagnosis of lymphosarcoma is dependent on biopsy of the involved tissue.

References

1. Sugarbaker, E. D., and Craver, L. F.: Lymphosarcoma. A study of 196 cases with biopsy. J.A.M.A., 115:17-23 (July 6) 1940.
2. Vieta, J. O., Friedell, H. L., and Craver, L. F.: Survey of Hodgkin's disease and lymphosarcoma in bone. Radiology, 39:1-15 (July) 1942.
3. Anlyan, A. J., Lovingood, C. G., and Klassen, K. P.: Primary lymphosarcoma of the lung. Surgery, 27: 559-563 (Apr.) 1950.
4. Grimes, O. F., Weirich, William, and Stephens, H. B.: Primary lymphosarcoma of the lung: a report of two cases. J. Thoracic Surg., 27:378-383 (Apr.) 1954.
5. Weissman, Irving, and Christie, J. M.: Primary lymphosarcoma of the lung: report of a case. A.M.A. Arch. Surg., 62:129-133 (Jan.) 1951.
6. Waller, J. I., and Shullenberger, W. A.: Lymphosarcoma of the prostate. J. Urol., 62:480-487 (Oct.) 1949.
7. Wintrobe, M. M.: Tumors and tumor-like conditions involving the blood-forming organs. In: Clinical Hematology. Pp. 890-964. Philadelphia: Lea and Febiger, 1951.

USE OF LIQUID OXYGEN IN DERMATOLOGY

(Continued from Page 152)

is especially valuable in cases which have been treated unsatisfactorily with other measures.

Summary

Liquid oxygen has been a useful agent in the treatment of warts, even though the results are not perfect. In our opinion it is the preferred treatment of the so-called mosaic wart. In our experience it has been also helpful in the treatment of hemangioma simplex and small keloids.

References

1. Irvine, H. G., and Turnacliff, D. D.: Liquid oxygen in dermatology. Arch. Dermat. & Syph., 19: 270 (Feb.) 1929.
2. White, A. D.: Liquid air: its application in medicine and surgery. M. Rec., 56:109 (July) 1899.
3. Pusey, W. A.: The use of carbon dioxide snow in the treatment of nevi and other skin lesions. J.A.M.A., 49:1354 (Oct.) 1907.
4. Kile, R. L., and Welsh, A. L.: Liquid oxygen in dermatologic practice. Arch. Dermat. & Syph., 57:57 (Jan.) 1948.
5. Allington, H. V.: Liquid nitrogen in the treatment of skin diseases. California Med., 72:153 (Mar.) 1950.

ccidental Gunshot Wounds

W. P. EDER, M.D.
Minneapolis, Minnesota

ENETRATING wounds produced by high velocity missiles have increased in numbers ince the end of World War II. The use of arms by any people during combat has projected itself nto more widespread interest in hunting, skeet and imilar sports. Large numbers of guns of various orts were returned as trophies from battlefronts hroughout the world. The improper care and andling of these weapons has increased the numer of accidental gunshot wounds. In consequence, he physician in areas some distance away from arge medical centers, and simultaneously within hose areas frequented by the greatest number of unters, finds himself more and more often called pon to treat the patient with gunshot wounds.

Types of Gunshot Wounds

Many attempts at classification of gunshot wounds have been made. No classification is enirely satisfactory. The type of missile which inlicted the wound is however of some importance o the physician.

The high caliber, relatively large missile tends o project itself in a relatively straight course. It is nimpeded by most bony structures and will produce rather extensive local trauma adjacent to its ath. Frequently, it will produce a through-and-hrough wound. Such a wound is productive of elatively massive hemorrhage because of the large ocal area which is traumatized. Many patients nflicted with this type of missile survive only a ew moments.

The relatively low velocity, smaller missile has he characteristic of penetrating the initial few nches of the integuments of the human body with ase and then to be rather easily deflected by carilaginous and bony structures and to course along he path of least resistance. Such a missile may wander over great distances, taking a circuitous oute, to imbed itself in either soft tissue or bone with relatively little force. This type of missile roduces very little local trauma because of its ize and velocity. However, because of its erratic ourse it frequently endangers many structures producing relatively widespread damage in comparison to its size.

The small, relatively high velocity pellet produces only minimal damage at the site of its penetration. Damage is relatively great because of the multiplicity of wounds rather than to the individual destruction produced by any one pellet.

Location of the Gunshot Wound

The location of the point of entrance of the missile is of great importance in the management of the patient with a penetrating gunshot wound. Gunshot wounds of the *head* produced by high velocity, relatively large, missiles are almost immediately fatal. In rare instances, the missile may avoid vital centers and the patient may be relatively asymptomatic except for the point of entrance and exit. Low velocity missiles of relatively small caliber frequently enter the calvarium and do not penetrate the opposite side. The missile lies within the substance of the brain. Since the bullet is of relatively low velocity, the local damage is not great. Such patients may have a minimum of neurological signs. When death is not instantaneous, hemorrhage within the brain is the primary problem because of damage to vital centers.

Gunshot wounds of the *face* produce widespread destruction and massive hemorrhage. If death is not instantaneous, the maintenance of an adequate airway become the primary problem. Destruction of the tongue, portions of the pharynx, larynx and trachea may not produce instantaneous death. However, death by asphyxiation within a few minutes may occur because of the massive hemorrhage and obstruction of the airway. Gunshot wounds of the *neck* should be treated as soft tissue injuries unless major vessels or the cervical spine are involved. In this type of injury, maintenance of an adequate airway is imperative in the immediate treatment of the patient.

Gunshot wounds of the *thorax* are of two primary types. When there is injury only of the lung parenchyma, hemorrhage and transient atelectasis are encountered. These, however, are usually self limited and there is adequate time to undertake correction of the hemopneumothorax. When, however, a major vessel has been entered, hemorrhage is massive and death is relatively rapid.

Gunshot wounds of the *abdomen* present the greatest single problem for treatment. In the absence of massive hemorrhage most patients with this type of injury will survive until immediate medical care is available. The multiplicity of organs within the peritoneal cavity makes the definitive treatment extremely difficult. Mortality rate in abdominal gunshot wounds is relatively high. The circuitous course of the missile within the peritoneal cavity makes thorough search of each organ imperative.

Treatment

The general consideration and treatment of gunshot wounds differs in no respect from similar wounds produced by other means. The treatment of shock is, of course, imperative. The maintenance of an adequate airway is always imperative. The use of wide spectrum antibiotics is indicated. Specific treatment may be briefly outlined as follows:

Gunshot Wounds of the Head.—Shock in this type of injury may be of neurogenic origin. The anatomical location of the entrance of the missile may indicate immediate severance of the middle meningeal artery and demand its urgent ligation. In general, supportive therapy is indicated with operative intervention only when there is progression of the coma or neurological findings to indicate increased intracranial pressure.

Gunshot Wounds of the Face.—Maintenance of an adequate airway is imperative. Immediate tracheotomy is often urgently indicated. Control of hemorrhage is important because of the vascularity of the area involved. Careful débridement and primary closure of facial wounds may be left for forty-eight hours while the patient stabilizes. Repair of fractures of the facial bones should be carried out within one week in order to produce the best cosmetic results. Primary reduction of multiple fractures should not be carried out unless the patient's condition has improved remarkably from the initial insult.

Gunshot Wounds of the Neck.—Maintenance of an airway is again imperative. Tracheotomy is often mandatory. Control of hemorrhage is imperative if a major vessel is involved.

Gunshot Wounds of the Thorax.—Primary attention should be centered on adequate respiratory exchange. The presence of a massive pneumothorax should be immediately detected and aspirated. Catheter thoracotomy may be indicated if continued hemorrhage occurs within the pleural space and if the initially reduced tension pneumothorax recurs. It is imperative that the hemothorax be adequately removed in order to prevent a constrictive pleuritis necessitating decortication at a later date.

Gunshot Wounds of the Abdomen.—Exploratory laparotomy is always indicated. In occasional instances, one may feel that the missile has penetrated only through the layers of the anterior abdominal wall in an oblique direction and has not entered the peritoneal cavity. Such patients should be explored. Failure to recognize perforation of an intraperitoneal viscus may lead to the patient's death. Incisions should be large so that the entire peritoneal cavity may be inspected. Perforations of the hollow viscera of the peritoneal cavity are usually in equal numbers since a point of entrance also requires a point of exit. The operator should not satisfy himself that all damaged organs have been adequately repaired until he has followed the gastrointestinal tract from the diaphragm down to the rectosigmoid. The liver, spleen and pancreas should be carefully inspected. The retroperitoneal duodenum must not be overlooked in the exploration. The renal and ureteral areas should be carefully inspected for signs of damage. In most instances, the missle should not be sought after and removed if it is lying in an unaccessible position and in such a position as not to jeopardize the patient's life.

Gunshot Wounds of the Extremities.—In the absence of vascular or neurological findings, gunshot wounds of the extremities represent penetrating wounds of the muscle which require only expectant treatment. Débridement of the point of entrance and exit is carried out to prevent early closure of the wound and to establish adequate drainage. Irrigation of the wound tract is contraindicated. Arterial injuries of the extremities are manifest by massive hemorrhage. Primary repair

(Continued on Page 180)

Sick People in a Troubled World

HOWARD A. RUSK, M.D.
New York, N. Y.

IMPROVEMENT in the health of the people of the developed parts of the world since 1900 constitutes one of the great achievements of the past half-century. Although some nations of the world still have pressing problems of communicable disease and life expectancy rates vary from nation to nation, the trend in all nations is toward a greatly increasing life expectancy—with the result that throughout the world we are producing an aging population. Medicine's number one problem in the developed areas of the world is no longer the acute, communicable diseases which claimed their victims with dramatic swiftness, but the slow insidious processes of the chronic diseases and the disabilities which they leave in their wake.

Lacking specific measures in the cure of many of the chronic diseases medicine must look to rehabilitation to teach those afflicted by disability to live and to work as effectively as possible. Until medicine finds the specific answers to the problems of the diseases of the heart and circulation, rheumatic fever and arthritis, cerebral palsy, multiple sclerosis, poliomyelitis, and the other crippling diseases, we must utilize the techniques of physical rehabilitation, psychology, social service, vocational counselling, and the para-medical specialties to teach the disabled to live within the limits of their disabilities, but to the full extent of their capacities.

We, as physicians, have a particular stake and a particular responsibility for this problem, for it is one that we have created—created with insulin, liver extract, vitamins, new surgical techniques, sulfonamides, antibiotics, cortisone, and everything else that has gone into making medical care what it is today.

Two thousand years ago, the average length of life was twenty-five years; at the turn of the century, it was forty-nine; recently compiled statistics of the National Office of Vital Statistics show the average length of life in the United States has now increased to sixty-eight. Today, there are more than 28,000,000 Americans who suffer from chronic disease and physical disability. Staggering as this is, we can expect it to increase in the future; for as our population becomes older, the incidence of chronic disease and its resultant physical disability will increase correspondingly.

Until recent years, the great majority of the medical profession looked upon rehabilitation as an extracurricular activity of medicine, something dealing with social work and vocational training, but something which had little concern, which held but few implications, for medicine. Today, however, that trend is being reversed, and although there are still many physicians who are unfamiliar with the aims and procedures of rehabilitation, more and more, medicine is beginning to recognize that medical care cannot be considered complete until the patient with a residual physical disability has been trained "to live and work with what he has left."

The recent tremendous surge of public and professional interest in rehabilitation has not been

CONTRIBUTIONS OF PURE SCIENCE TO PROGRESSIVE MEDICINE

In other words, the great majority of patients seriously ill can be rehabilitated before operation or aided in weathering the storms of readjustment following operation.

Physicochemistry of the human body concerns life itself. A proper understanding of these vital processes is necessary to every man who practices medicine, no matter what his specialty may be; and as for the surgeon, the newer knowledge is changing his outlook. By calling to his aid the scientist, the internist and the various specialists, he is able to bring relief to a large number of patients who formerly were looked on as beyond help, or who, unprepared for operation, were subjected to a high risk. Rehabilitation is to be a master word in medicine.—WM. MAYO, M.D., The Journal of the American Medical Association, 84: no. 20 (May 16) 1925.

Dr. Rusk is Professor and Chairman, Department of Physical Medicine and Rehabilitation, New York University-Bellevue Medical Center; President, International Society for the Welfare of Cripples.

This paper is based on an extemporaneous address presented by the author at the Recognition Exercises honoring the Senior Class in Medicine, University of Minnesota Medical School, June 10, 1955.

limited to the United States. Great Britain and the Northern European nations, faced as we are in this nation with a striking increase in chronic disability resulting from the extension of the life span, have long recognized the medical, social and economic values of rehabilitation.

This interest now, however, is being seen in Latin America, the Near East, Southern Europe, and Asia, in those parts of the world commonly termed "underdeveloped." In some of these nations, rehabilitation services are provided by voluntary groups which are national affiliates of the International Society for the Welfare of Cripples. In others, the national or local governments have built the facilities and operate the programs.

This spring, a new Rehabilitation Institute for the Blind was opened in Mexico City. An important part in its planning was played by an American specialist from the Office of Vocational Rehabilitation, which has been in Mexico the past three years under the Institute of Inter-American Affairs, helping the Mexican government organize services for the handicapped.

The International Society for the Welfare of Cripples' affiliate in Lebanon is developing a rehabilitation program for children in Beirut which will be affiliated with the Pediatrics Department of American University. The World Health Organization is providing personnel and the United Nations International Children's Fund equipment for the new center.

In Korea, the Republic of Korea, the United Nations Korean Reconstruction Agency and the American-Korean Foundation teamed together two years ago to open a 300-bed National Rehabilitation Center at Tongnae, just outside of Pusan.

These developments over the world did not just happen. Behind them, particularly in the so-called "underdeveloped areas" of the world there is beginning to emerge a new concept of the dignity of man and the value of the worth of the individual that is being symbolized and expressed in the development of rehabilitation services for the handicapped.

Just as our own favorable geographical, political, economic, cultural and social circumstances have placed the United States in a position of world leadership and responsibility in so many other fields of endeavor, we bear a special responsibility globally in the development of rehabilitation services to the handicapped. But in accepting this responsibility, we are serving more than high idealistic, moral and humanitarian ends.

Peace is never a product of military force alone. Nearly ten years of the cold war have taught us that political health of our own nation and of the world depends on the physical and mental health of our people.

Today through the World Health Organization, the United Nations, our own Foreign Operations Administration and various international voluntary organizations, we have tangible and specific methods through health for building strong allies and true friends.

Experience has long shown that rehabilitation services for the disabled is a purchasable commodity. Today the world now has the technical knowledge and skills to bring improved rehabilitation services to the disabled no matter where they live. Results can be anticipated almost in direct ratio to the efforts and funds expended.

Aside from the political and economic significance of improving the health of the people of the world, rehabilitation can also provide the understanding between peoples and nations that is the essential foundation of any political effort toward peace. This has been brought forcibly home to me during the past few years when I have had increased opportunities for personal travel and have seen directly the results which can be achieved in international understanding through rehabilitation and services to the handicapped.

Last September at The Hague, for example, at the Sixth World Congress of the International Society for the Welfare of Cripples, there were 800 delegates from thirty nations. Physicians, nurses government officials, employers, therapists and interested citizens, they had one common interest—how services for the disabled in their own nations and globally could be improved and extended.

They came mostly at their own expense because of their desire to learn and to share their experiences and knowledge with others.

Two unmistakable facts emerged from the meeting. The first—and very encouraging—is that rehabilitation services for the disabled are increasing rapidly throughout the world. The second—and equally discouraging—is that the number of persons needing such services is increasing more rapidly.

A part of the increasing incidence of physical disability found in the developed parts of the world results from the lengthening of the life span through medical advances, better public health and improved living standards.

Persons who a few decades ago would have died from acute communicable diseases now live and in their later years acquire such crippling afflictions as arthritis, multiple sclerosis and Parkinson's disease, or they suffer strokes.

Similarly each year, medical advances are made that prevent death but leave survivors with severe disabilities. Each represents a precious human life saved, but it raises the question of whether the society that can save a life can also, through rehabilitation, give that life dignity, purpose and meaning.

Never before in human history have our opportunities for reaching this objective of lives of dignity, purpose and meaning for the disabled been as great. Today, we can approach with confidence many disabling conditions which, even as recently as twenty years ago, were generally accepted as hopeless. But the greatest of these assets is not the skill of the surgeon, the wonders of antibiotics, or modern techniques of selective placement—our greatest assets are these patients themselves.

When I was in Poland in 1949, I went through a concentration camp in Auswich, the largest one there. In a room half the size of this large center section, the first thing one saw was a bin filled with braces and crutches and canes and prosthetic devices, because the cripples were the first who went to the gas chamber. Hitler forgot that that was the spirit of Germany. The Communists forgot in 1950, and most of us forgot that it happened.

The year before the Communists marched down into South Korea, they drove across the thirty-eighth parallel a million people—the old, the halt, the sick, the lame, and the blind—feeling that if they put this load on the staggering economy, it would cause it to fail. It had just the opposite effect. It gave the South Koreans strength that they didn't know it was possible to have. Refugees were taken in, the food was shared, the warmth was shared, the clothing was shared. And it became a part of the great spiritual strength that has allowed this little country to lose more people than we lost in World War I, World War II and the Korean War put together, times two, and still ask for the privilege of continuing to fight to be free.

In our planning for the future of such persons, we have too frequently operated under the fallacious concept of generations ago that success and ability to do a given job was dependent upon physical strength. This, however, has not been true since the days of the cave men, and most of us today use less than 25 per cent of our physical capacities in daily living. The great single asset in our work, however, is still the patient and the tremendous powers of recuperation and compensation which the patient possesses.

The blind man, for example, has lost his sight, but he has compensated for that loss by overdeveloping his senses of touch and hearing, for this is the way he now sees. He carries the white cane and taps it because his ears are so acutely attuned that he can tell whether the echo coming back is from a wall or from an area of trees or if he is in an open space. Put the blind man to work in a photographic darkroom or in his own environment and he will turn out 30 per cent more work than the man with sight who is working by his side.

Society today pays for only two things: what we have in our heads and the skill in our hands. But compared with the average, so-called "normal" person, the person with a severe physical disability often has another asset in far greater supply than we have—that is their depth of spirit.

Of the various phases of international health endeavors there is none today in which the efforts of all—both governmental and voluntary—have been more closely integrated than in rehabilitation. It is not surprising that we have and are achieving this high degree of co-operation in our work for the handicapped where, in many instances, those concerned with other forms of human relationships have failed.

I have tried to state these reasons in a short statement which I prepared some time ago for Edward R. Murrow's program, "This I Believe." I would like to close by reading this statement for it is my own philosophy about "Sick People in a Troubled World."

"I can't remember when I didn't want to be a doctor. Even as an adolescent when I scrubbed floors and ran errands at the local hospital in order to smell ether and go on rounds with the country doctor, surgery did not spell the glamour in medicine to me. It was people—sick people—their suffering, their problems and their victories that challenged.

"It has been a rare privilege to be a doctor in medicine's golden era. Far more scientific advances have been made in the last three decades than in all time heretofore. Man's life span has increased from eighteen two thousand years ago to sixty-eight in America today.

"But I have found it impossible to ignore the fact that these great medical advances have posed new problems. Crippled children who in the past would have died early in life now survive. They want to grow and work and love and be loved.

"I have heard old people to whom we have added these years ask, 'For what—the shelf to wait for death, or an opportunity to live and work in dignity as long as we are able?'

"Millions of veterans throughout the world who have scarred their minds and given parts of their bodies to war have more than earned their right to live and love and work and to know that their sacrifice has at least been one small stone that is being used to build a better world.

"Sick people throughout the world ask their God, 'Why must I suffer?' Possibly the answer comes in the work of the potter. Great ceramics are not made by putting clay in the sun; they come only from the white heat of the kiln. In the firing process, some pieces are broken, but those that survive the heat are transformed from clay into objects of art, and so it is, it seems to me, with sick, suffering and crippled people. Those who, through medical skill, opportunity, work and courage, survive their illness or overcome their handicap and take their places back in the world have a depth of spirit that you and I can hardly measure. They haven't wasted their pain.

"Because of this experience, they have a desire to share that is almost a compulsion. It matters not whether they be a physician from India, a Zionist from Israel, a Greek veteran or a Pole disabled in a mining accident—all want to share the understanding they have gained through suffering or by helping those who have suffered.

"I believe that this basic and inherent desire of man to do something for his less fortunate fellow transcends religious dogmas, political beliefs and geographical barriers. If we could only use this universal language, we would have a tool to unravel the babel of tongues and an instrument which would penetrate any iron curtain or closed boundary.

"It does not seem strange to me that the sick should turn to those who have suffered for their greatest comfort. And so, in a sick world, it is not strange that we turn to those who have been ravaged by suffering and disease for a common language. If we could start to work here together in a program where all of us have the same goals, it is more than possible that, with God's help, we would find the solution for living together in peace. This I Believe!"

TREATMENT OF SEVERE INJURIES OF THE HAND

(Continued from Page 150)

will insure the successful outcome of treatment of hand injuries. Bunnell has said that one cannot fix a watch in the bottom of a bottle of ink. Similarly, we are handicapping ourselves in operating on the small structures of the hand if our field of vision is occluded by blood. Major hand surgery should be accomplished on a dry operating field maintained by pneumatic tourniquet. Then again, we cannot do fine work with large instruments designed for abdominal or large extremity work. Large instruments may cause increased trauma to tissue and clumsiness in repair. We must not jeopardize our work by not having the right equipment and the right operating conditions.

Boyes suggested that we give 10 points to each element—the material, the principle and the technique—and that our "batting average" would then be equal to the product, not the sum, of our rating in each of these sections. It can be seen then that we can drop only a few points in each component before our average will fall off precipitously. If we are going to do the best that we can to prevent serious crippling in the severely injured hands that come to our care, we must not be confused about the anatomy, must not make poor decisions as to what needs to be done, and must not handicap ourselves with inadequate instruments or poor working conditions.

Reference

1. Hauge, M. F.: Acta Orthopedica Scandinavia, 24: 258-270, 1955.

Medicine in Southern Minnesota

DAVID P. ANDERSON, M.D.
Austin, Minnesota

IT is a prerogative of the president of the Southern Minnesota Medical Association to deliver an address on a subject of his own choosing. I prefer to confine my remarks to matters close at hand. This, then, will be somewhat of a "State of the Union" address on medicine in southern Minnesota.

I think it is obvious to all of us that the state of the union is good. Good medicine is practiced in southern Minnesota. Good medical practice is moving to the small communities, and our section of the country has made progress, in this respect, that far surpasses the tremendous general progress in medicine during the past decade. I invite any disbelievers to make rounds with us in our small community hospitals.

There are many intricately interwoven reasons to explain our gratifying progress. I will mention a few, simply that we may pause for a while to count our blessings.

An influx of well-trained young men, both specialists and much-needed general practitioners, has certainly been a healthy stimulus in recent years. The middle-aged and older physicians that I know have accepted this challenge of young competitors by utilizing any special knowledge of their young colleagues advantageously, while still competing forcefully in the only way that really counts; namely, by giving their patients *good* medical care. This, too, has created a healthy situation, for wisdom gained by experience and refreshed by a continuous search for knowledge is hard to beat.

Without wishing to slight my other fellow specialists, I would like to point out that the present availability of x-ray specialists has been a particularly valuable addition to our small communities. It is hard to conceive of practicing medicine without a roentgenologist handy, isn't it! And yet only a few years ago you could hardly find one anywhere. Incidentally, I secretly envy these fellows: They do not have to compete with anyone, except the occasional patient with poor and sphincter control. They can live in the midst of the crowd and keep with perfect sweetness the independence of solitude.

It seems almost superfulous to mention the favorable influence of our two large, nearby medical centers upon medical practice in our area, and yet we must never forget our geographically favorable position. Where else can an ordinary country surgeon pick up a telephone and, for a few cents and on a first-name basis, get the gracious assistance of any number of the world's best consultants? I never feel belittled by asking for such help when I need it. On the other hand, I have no intention of being overwhelmed by the competition or misled into the debilitating practice of dumping all my tough problems in someone else's lap.

We are also grateful for the advantages in postgraduate education which are offered by the proximity of our medical centers and by the continued efforts of the directors of these centers to make their teaching facilities available to us. We should make the most of our opportunities.

One cannot fail to recognize the fact that a favorable economy and the rapidly increasing coverage of our population with voluntary health insurance plans have been big factors in the improved medical care which we are now enjoying. Health is no longer much neglected for financial reasons.

It is regretable that a few patients, hospital administrators and physicians have abused insurance coverage, at least in principle, even though they may be within the limits set forth in the fine print. This practice is not widespread—I would say that 99 per cent of us lean over backwards to be fair and honest to both the patient and the insurance carrier. It is hard to deliniate a clear line of cleavage between the many essential x-rays and other diagnostic studies that are demanded by medical science and the modern charlantry of diagnosis by exhaustive tests. Certainly the problem patient deserves "the works," but when every patient be-

---

Presidential address delivered at the annual meeting of the Southern Minnesota Medical Association, Albert Lea, September 12, 1955.

comes a problem patient, one's colleagues begin to wonder. I suspect that a mixture, in unknown proportions, of a subconscious appreciation of one's own ignorance, avarice and just plain laziness motivates the offenders. I also suspect that these offenders do not appreciate the fact that they are easily spotted by their colleagues, nor do they seem to realize that they are a cancerous growth that could kill the health-insured goose that lays such nice golden eggs. The fact that seemingly intelligent patients continue to return to them and that they occasionally unearth a surprise diagnosis would seem to be poor compensation for the practice of bad medicine disguised by good x-ray and laboratory tests.

Now that I have slipped over into a somewhat critical attitude, I should like to continue along this line for a brief time. Before doing so, I would like to reiterate that the practice of medicine in southern Minnesota is good—very good. Under such circumstances one can be sharply critical without fear of offending too many people. It's a good time, though, to evaluate our own faults, while they are few in number and easily erradicated.

There has been a great deal—in fact, too much—said and written about the evils of unnecessary surgery and fee-splitting in recent years. The problem is almost non-existent with us, I am sure, but let us continue to be frankly and openly disapproving of any offenders. Let us be honest with ourselves in evaluating our own surgery: it's the hardest thing in the world to do, I know, for a general surgeon to decide what *not* to do. The problem must be even more difficult for the general practitioner doing some general surgery. I know there are many general practitioners who do quite acceptable major surgery, and I personally see no reason for specialty groups to attempt to arbitrarily limit them; the honest practitioner will limit himself. The greatest of faults, though, is to be conscious of none, and this creates the greatest of surgical problems, or perhaps I should say, the greatest "problem surgeons": how does one limit the man who is doing surgery he has no business doing? I know of no good answer, unless it be that we so continuously expose such men to the disease of intellectual honesty that they eventually catch it.

One final thought. The doctor is constantly being drafted, often too willingly, for civic activities of all types. I know that we physicians have been criticized for failure to uphold our civic duties and that we have definite obligations to our communities, churches, service clubs and many worthy causes; but I would like to interject a small word of caution: this thing can be overdone. Somewhere along the line, if one has too many civic commitments to fulfill with promptness and efficiency, patients are sure to be neglected.

"The physician lives not for himself but for others. This is the essence of his profession. Do not look for fame or profit. Work to save others though you lose yourself. Maintain life, restore the sick and ease the suffering of man. You have no other object."

ESOPHAGEAL HIATUS HERNIA

(Continued from Page 143)

included a right pneumothorax in one patient, and the thromboembolic episodes in two.

One patient died of a myocardial infarction two months postoperatively. Though his preoperative electrocardiogram was negative, one wonders in retrospect whether his coronary disease rather than his hernia was responsible for his pain. The remainder of the patients are living and well, and there has been no evidence of recurrence of any of the hernias. One patient, an intensely conscientious executive, has had a return of some vague gastrointestinal symptoms, but a recheck x-ray examination is negative. The rest of the patients are asymptomatic.

In conclusion, we feel that many people with vague upper abdominal complaints should be studied with hiatal hernia in mind; if the defect is present, well-planned treatment will usually relieve the patient of his symptoms.

References

1. Kirklin, B. R., and Hodgson, J. R.: Roentgenologic characteristics of diaphragmatic hernia. Am. J. Roentgenol., 58:77-101, 1947.
2. Carey, J. M., and Hollinshead, W. H.: An anatomic study of the esophageal hiatus. Surg., Gynec., & Obst., 100:196-200 (Feb.) 1955.
3. Ohler, W. R., and Ritvo, Max: Diaphragmatic (hiatus) hernia. New England J. Med., 229:191-196, 1943.
4. Nicholson, Frank: Diaphragmatic hernia. Ann. Surg., 136:174-182, 1952.
5. Allison, P. R.: Reflux esophagitis, sliding hiatal hernia, and the anatomy of repair. Surg., Gynec., & Obst., 92:419-431, 1951.

Case Presentations

Henoch-Schoenlein's Purpura

JOHN T. OLIVE, M.D., and
CHESTER E. THIEM, M.D.
Mankato, Minnesota

HENOCH-SCHOENLEIN'S purpura is a generalized disease consisting of a characteristic skin lesion and found associated with joint symptoms, gastrointestinal colic and bleeding, with swelling of the face, extremities, and scrotum. The skin lesion, progressing from urticaria to typical purpura, is the prime feature of the disease. It may be associated with any or all of the other symptoms.

In 1837, Schoenlein[1] recognized the combination of rash with joint symptoms as related and named it "peliosis rheumatica." In 1874 Henoch[2] described the disease in four children and noted the association with hematuria. Osler[3] was especially interested in these cases and felt that the symptoms were manifestations of an anaphylactic phenomena. He wrote: "The anaphylactic key will unlock the mystery of these cases." In 1948 Gairdner[4] showed that both infection and hypersensitivity were involved. Lewis[5] has compared this disease with nephritis and rheumatic fever and concluded that they may have a similar etiology.

The following case report is of interest because it illustrates the characteristic features of the disease.

Report of a Case

A boy, eight years of age, was admitted to the hospital because of fever and a sore throat of three days' duration. He had had two previous episodes of severe sore throat, during one of which it was feared that a tracheostomy would have to be done. However, he had recovered fully from both attacks. He had had uncomplicated measles and chicken pox. His past health had otherwise been good. His growth and development were normal. He was an only child of healthy parents.

Physical examination revealed a severe follicular tonsillitis surrounded by an inflamed, edematous area covered by a whitish, purulent, exudate. He had tender and enlarged cervical lymph glands and complained of severe pain with swallowing. His temperature was 102° F. Examination was otherwise normal.

Laboratory examination revealed a normal urinalysis; the hemoglobin was 12.8 gm., and the leukocyte count was 11,950 per cu. mm.; B hemolytic streptococcus was cultured from the throat.

He was given an adequate dosage of oxytetracycline and saline irrigations of the throat. The following day he was much improved. His temperature was normal and he was able to eat and drink without pain. On the third hospital day he developed painful swelling of his knees, wrists, elbows, and ankles. His temperature rose to 100° F. and his Sedimentation Rate was 33 mm. (Westergren). An electrocardiogram showed an increased P-R interval. A diagnosis of rheumatic fever was made and a course of salicylates was started using aspirin in adequate dosage. On the fifth hospital day the boy showed no improvement and it was decided to discontinue aspirin in favor of cortisone. While on cortisone, the boy showed some improvement with less pain and swelling of the involved joints. On the ninth hospital day he suddenly developed marked edema of the face, extremities, penis, and scrotum. Cortisone was discontinued with the thought that edema was due to sodium retention. During the next two days the edema of the extremities disappeared, but continued in the face, scrotum, and penis. On the eleventh hospital day a fine purpuric rash appeared over his ankles, knees, arms, and buttocks. He began complaining of severe abdominal and chest pain. Upon examination his abdomen was rigid, very tender to palpation, and simulated an acute peritonitis. Laboratory findings included gross hematuria, Grade III albuminuria, sedimentation rate of 40 mm. per hour, normal platelet counts, normal blood urea nitrogen, and a normal bleeding and clotting time. The Rumpell-Leeds test was positive showing 15 to 20 petechiae per square inch on the left arm. These findings occurred concurrently with the appearance of purpura.

The boy then gradually improved. On his fourteenth hospital day the urine revealed microscopically Grade I hematuria and the albuminuria had disappeared. The areas of purpura were fading and the edema of the face and genitalia was almost gone. It was decided to send him home for further treatment consisting only of bed rest and a low salt diet.

During the following two weeks at home, he developed several transient areas of purpura on his trunk and extremities and also had intermittent severe abdominal

---

Presented at the annual meeting of the Southern Minnesota Medical Association, Albert Lea, September 12, 1955.

and chest pain which required codeine for relief. During the third week at home, the boy developed persistent bloody stools and was readmitted to the hospital. Examination at this time revealed no purpura, swelling, or joint pain. Laboratory investigation revealed a normal urinalysis, hemoglobin of 12.4 gm., 4.85 million erythrocytes per cu. mm. and a sedimentation rate of 26 mm. per hour (Westergren). During the next two hospital days the bloody stools subsided and he was again discharged.

During the next month bed rest was continued at home and he had no recurrence of his symptoms. His sedimentation rate gradually fell to normal. He was gradually returning to full activity over a three-month period and has not had an exacerbation to this date, six months after his original episode.

Comment

This patient exhibited all of the features of Henoch-Schoenlein's purpura. Infection of the throat with B hemolytic streptococci was followed by the typical complex of: purpura, arthritis, swelling of the extremities, abdominal pain with bloody stools, and hematuria. These symptoms were intermittent for a period of one month.

The etiology of Henoch-Schoenlein's purpura is unknown. However, it may belong to the group of diseases which represent a state of hypersensitivity and are known as the "collagen diseases." The hypersensitivity may be either bacterial, following B hemolytic streptococcus infection, or nonbacterial, following exposure to specific protein antigens. Sir William Osler[3] first made note of this and it has since been called "anaphylactoid purpura." Occasionally it occurs concurrently with rheumatic fever.[4] The hematuria that occurs is indistinguishable from that of acute nephritis[6] and is associated with albuminuria, cylinduria, and rarely a hypertension.

The purpura is the differentiating factor, without which the diagnosis cannot be made. Gairdner[4] has described in detail the pathogenesis of these lesions and has shown a progression from simple urticaria through a maculopapular eruption to typical purpuric lesions. The purpura may be associated with one or all of the previously mentioned findings. The platelets are normal in number and the bleeding and clotting time are usually normal. The Rumpell-Leeds test may also be positive.

Henoch-Schoenlein's purpura is primarily a disease of children; it has its highest incidence at three years of age. It occurs more commonly in males than in females. The duration of the initial phase may be from three weeks to six months. Relapses of the purpura are common.

The abdominal pain, which often initiates the onset of the disease, may be very severe and simulate an acute abdominal emergency. It is for this reason many of these cases have exploratory laparotomies performed before the true nature of the disease is ascertained.

In this case the acute nephritis was of short duration, lasting only a few days. Some, however, are not so fortunate and develop into a chronic or latent nephritis. Wedgewood[7] describes ten children of a series of twenty-six that had abnormal urinary findings several months after the initial attack. This appears to be more common in the child over six years and also those who have had several relapses of the disease.

Treatment of our case was confined to bed rest. Recently some authorities[8] have used cortisone and adrenocorticotropic hormone during the acute phase of the disease. They feel that the course of the disease is not significantly shortened and it does not prevent the urinary complications.

References

1. Schoenlein, J. L.: All. u spec. Path. u Therap., Herisau, Lit.-Compt., 11:48, 3rd ed., 1837.
2. Henoch, E.: Vorlesungen uber Kinderkronkheiten. P. 839, 10th ed. A. Berlin, Hirschwald, 1899.
3. Osler, W.: The visceral lesions of purpura and allied condition. Brit. M. J., 1:517, 1914.
4. Gairdner, D.: The Schoenlein-Henoch syndrome (anaphylactoid purpura). Quart. J. Med., 17:95, 1948.
5. Lewis, I. C.: The Schoenlein-Henoch syndrome compared with certain features of nephritis and rheumatism. Arch. Dis. Child., 30:212 (June) 1955.
6. Philpott, M. G.: Henoch-Schoenlein purpura in childhood with particular reference of occurrence of nephritis. Arch. Dis. Child., 27:480 (Oct.) 1952.
7. Wedgewood, R. J. P.: Anaphylactoid purpura (Schoenlein-Henoch syndrome). 16:196 (Aug.) 1955.
8. Philpott, M. G., and Briggs, J. N.: Treatment of the Henoch-Schoenlein's syndrome with adrenocorticotrophic hormone and cortisone. Arch. Dis. Child., 28:57, 1953.

Continuation Studies

Infectious and Postinfectious Encephalitis

PAUL M. ELLWOOD, JR., M.D.
Minneapolis, Minnesota

THIS paper deals only with the infectious, postinfectious and post-vaccination encephalitides which occur with reasonable frequency in the Minnesota area. It is our opinion that with the increased use of the poliomyelitis vaccine these various encephalitides will become of increasing importance as a diagnostic consideration in patients manifesting symptoms of encephalitis.

Primary Encephalitis

The primary encephalitides are presumably due to direct invasion of the central nervous system by viruses pathologically producing neuronal destruction in the brain and spinal cord and commonly a syndrone of fever, headache, stiff neck and pleocytosis. With the advent of modern tissue culture techniques for the diagnosis of poliomyelitis, an attempt has been made at Elizabeth Kenny Institute to make an etiological diagnosis of all patients referred to the Institute as nonparalytic poliomyelitis with the above symptom complex. Poliomyelitis virus isolation and antibody studies were carried out by Dr. Jerome T. Syverton of the Bacteriology Department, University of Minnesota, and antibody studies for other viral encephalitides by the Communicable Disease Laboratory of the Minnesota Department of Health under the direction of Dr. Henry Bauer. Diseases are listed in the frequency in which they were encountered at Elizabeth Kenny Institute during 1954 and 1955.

Poliomyelitis.—This disease is due to three antigenically distinct viruses, each one capable of producing the same clinical symptomatology. The disease is apparently disseminated from person to person. The most commonly quoted incubation period is approximately fourteen days, but the virus is known to remain in the stools up to three or four months after onset. Poliomyelitis follows a biphasic course, especially in children, the first phase of which is nonspecific. The secondary phase affects the central nervous system with fever generally lasting five days. Scattered lower motor neuron palsies, which occur during the course of the febrile illness and when present in the absence of sensory changes, are diagnostic.

Nonparalytic poliomyelitis, in our experience, has been clinically indistinguishable from most of the other viral encephalitides. Prognosis with poliomyelitis is, of course, highly variable, but with nonparalytic poliomyelitis is excellent.

Mumps Meningoencephalitis.—Mumps virus has been isolated from the central nervous system on numerous occasions. Mumps meningoencephalitis is a very common disease reported to occur is up to 30 per cent of cases of parotitis. The symptoms of encephalitis generally follow those of parotitis but can precede or occur in the absence of visceral involvement. The disease usually runs a benign course with minimal disturbance of sensorium or evidence of neuronal involvement. A rare, yet characteristic, complication is involvement of the VIII cranial nerve producing vomiting, vertigo and deafness. This disease is one of the most benign of the viral encephalitides.

Lymphocytic Choriomeningitis.—Lymphocytic choriomeningitis, due to a virus found in lower animals and generally transmitted to man from the infected excreta of mice, is more common in the winter months but cases have been reported in Minnesota in every month of the year. The incubation period in the experimental infection in man is from twenty-four to seventy-two hours. The disease produces a very diverse clinical pic-

---

Read at the Continuation Course in Pediatrics at the Center for Continuation Study, University of Minnesota, September 21-22, 1955.

From the Departments of Pediatrics and Neurology, University of Minnesota, and Elizabeth Kenny Institute, Minneapolis, Minnesota.

ture. Fever often is bi- or triphasic; respiratory symptoms in the pre-central nervous system stage of the disease are the unique feature. Fever in most cases lasts five days and while the course is often benign, coma, paralysis and post-encephalitic Parkinsonism have been reported. Complications of this type notwithstanding, the prognosis is in most cases good.

TABLE 1. TYPICAL FINDINGS IN LABORATORY DIAGNOSIS OF VIRAL ENCEPHALITIDES

Disease	*Cerebrospinal Fluid*			*Diagnostic Tests*
	Cells	Sugar	Protein	
Poliomyelitis	Mean 56 0-1000	Normal	46 mg.% 20-150 mg.%	Neut. antibody rise within 2 wks. *Virus isolation from feces
Mumps	Mean 400 9-1700	Normal	Normal	C-F antibody rise in 10 days
Lymphocytic Choriomeningitis	Mean 700 0-6000	Occas. Low	Gen. Elev. 15-300 mg.%	*C-F antibody rise in 15-30 days Neut. antibody rise in 60-180 days Virus isolation from CS fluid
Coxsackie	Mean 20 6-200	Normal	Normal	Virus isolation from feces
Equine Encephalitis	Mean 200 50-1000	Normal	Sli. Elev. 20-70 mg.%	Neut. antibody rise in 14-30 days *C-F antibody rise in 14-30 days

**Best diagnostic technique*

Coxsackie.—There is a reasonable amount of evidence to incriminate the B group of Coxsackie virus with encephalitis. These viruses have been isolated along with polio viruses in many known cases of poliomyelitis at Elizabeth Kenny Institute. The most frequently described clinical picture is herpangina and myalgia associated with symptoms of meningeal irritation and fever. There have been no sequelae and no fatalities among our cases.

Western Equine and St. Louis Encephalitis.—The mosquito is known to be the vector, but the true reservoirs of infection are not definitely known. The incubation period is highly variable, being from five to twenty-one days. Arthropod-borne encephalitides, like so many other members of this group, cannot be differentiated clinically but the clinical features of the disease vary greatly with the age of the patient. The disease is far more severe in infants under one year of age than in older children and adults. Convulsions and drowsiness are common in infants. This disease can be transmitted to the fetus from an infected mother. The most common sequelae are convulsions, behavioral disturbances and upper motor neuron signs. Sequelae have been reported to occur in up to 50 per cent of children under one year of age to a low of 20 per cent in children between the ages of five and fourteen.

Encephalitis of Undetermined Etiology.—At least 10 per cent of the patients referred to Kenny Institute with fever, headache and pleocytosis have been undiagnosable by existing techniques and apparently represent infections due to as yet undiscovered infectious agents.

Laboratory Diagnosis.—Table I shows the typical spinal fluid findings in the viral encephalitides and also lists the diagnostic tests which have been found to be useful in making a definitive laboratory diagnosis. Most of these diseases have spinal fluid cell counts which fall between the range of 50 and 250 and therefore provide little help in the actual diagnosis. Lymphocytic Choriomeningitis, however, often has a very high cell count of a mononuclear type which is highly suggestive of this diagnosis. The differentiation of lymphocytic choriomeningitis from tuberculous and other bacterial meningitides is occasionally complicated by the fact that spinal fluid sugars are sometimes abnormally low in this disease.

Secondary Forms of Encephalitis

These forms of encephalitis follow especially the xanthematous virus diseases and vaccination against smallpox. Their exact etiology is unknown, the prevailing theories being (1) direct invasion of the central nervous system by viruses, (2) activation of a second virus already present in the central nervous system, (3) damage to the central nervous system by toxic products of the viral infections, and (4) an antigen antibody reaction.

Post-Viral Encephalitides

The post-viral encephalitides are usually more severe than the primary viral encephalitides. Direct destruction of neurons is unusual, but extensive myelin destruction adjacent to blood vessels is the most common pathological manifestation.

Measles Encephalitis.—The incidence of measles encephalitis varies with the epidemic, the usual case rate being one case of encephalitis to 1,000 cases of measles. Measles, when modified by gamma globulin, or when prevented, is rarely followed by encephalitis. The acute phase of the disease lasts approximately a week with stupor, convulsions and upper motor neuron signs being commonly reported as the early symptoms. These symptoms usually appear within five days after the appearance of the skin eruption but have been reported as appearing during the prodrome and as long as ten days after the skin eruption. Children manifesting extremely severe symptomatology in the acute phase of this disease often recover to a remarkable extent. Shaw reports in an article in the *Journal of Pediatrics* that one-third succumb, one-third recover with severe sequelae and one-third are normal and have minimal sequelae.

Varicella Encephalitis.—Chickenpox encephalitis generally follows skin eruption by three to eight days; its occurrence seems unrelated to the severity of varicella. The disease is much less common than measles encephalitis although the early symptomatology is quite similar. Ataxia and cerebellar symptomatology have been noted in a larger percentage of cases than in any other form of encephalitis. Age seems to bear no relationship to prognosis in this form of encephalitis. Convulsions are an ominious prognostic sign. The prognosis is somewhat better than measles, both acutely and in terms of sequelae.

Smallpox-Vaccination Encephalitis.—The highest reported incidence in all age groups is 1:5000. The disease is extremely rare in infants under one year of age. Some series quote a rate as low as 1:800,000. Symptoms generally appear ten to fourteen days after the vaccination with the disease following a hyperacute course; hyperthermia, coma and respiratory and cardiovascular complications are quite common. The mortality rate from post-smallpox vaccination encephalomyelitis is high—between 35 and 60 per cent.

Post-Bacterial Encephalitides

The pathogenesis of these diseases is very poorly understood. The actual pathological manifestations differ from the post-viral encephalitides in that there is often extensive endarteritis, perivascular bleeding and neuronal destruction. As a group they represent one of the more severe forms of encephalitis.

Post-Pertussis Encephalitis.—While the pathogenesis of post-pertussis encephalitis is not understood, it is observed often to begin after a paroxysm of coughing. This variety is much more common in the very young and produces severe motor and medullary disturbances, as well as mental retardation. According to Livingston in *The Diagnosis and Treatment of Convulsive Disorders in Children,* this disease is the most common cause of post-encephalitic convulsive disorders despite the wide use of pertussis vaccination.

Post-Pertussis Vaccination Encephalitis. — The symptoms of this variety of encephalitis occur from one hour to one-and-a-half days after the injection of pertussis vaccine. Livingston, in his monograph on convulsive disorders in children, which covers a study of approximately 7,000 children with recurrent convulsions, seriously questions whether children with convulsive disorders or convulsive tendencies are any more likely to develop cerebral complications from pertussis immunizations than are other children. The onset of post-pertussis vaccination encephalitis is explosive with the most common symptoms being fever, convulsions and motor disturbances. Prognosis is not good for those cases manifesting motor symptoms and recurrent convulsions which may gradually clear up over a period of many months, or persist indefinitely.

Scarlet Fever and Rheumatic Fever.—Encephalitis, excluding Sydenham's chorea, accompanies rheumatic fever more commonly than scarlet fever in which it occurs in two cases in 10,000. It is characterized by many more behavorial disturbances than the other forms of encephalitis; acute delirious mania and extreme psychomotor activity, accompanied by choreiform movements and incoordination, are the common symptom complex. The mortality rate is reported to be 15 per cent, 40 per cent having permanent sequelae especially in the form of behavioral disturbances.

Treatment

The treatment of the diseases described above is almost entirely prophylactic and symptomatic. The important factor in the treatment is to anticipate involvement of the vital structures by heeding such warnings as facial palsies which generally precede involvement of medullary respiratory and cardiovascular centers and shoulder musculature involvement which often precedes paralysis of muscles of respiration. Conflicting reports have appeared concerning the therapeutic value of ACTH and cortisone in the post-infectious encephalitides. These agents are contraindicated in the primary viral encephalitides with the possible exception of mumps.

Sedatives should be used only with great care, especially respiratory depressants such as morphine and barbiturates.

Respiratory Management.—Respiratory insufficiency secondary to airway obstruction and respiratory infections is the most common cause of death in these diseases.

Airway obstruction can be prevented through the use of postural drainage and frequent suctioning. In rare instances, tracheotomy may be necessary. The value of intubation in emergency cannot be overemphasized.

Infection can be prevented through frequent turning, pounding of the chest, humidity, expectorants and prophylactic antibiotics.

Respiratory paralysis requires use of the respirator. If none is available, "bag breathe" with an anesthesia machine. If respiratory paralysis is due to involvement of the respiratory center with sparing of the muscles of respiration, curare can be used to relax the patient in the respirator.

Vascular Insufficiency.—Rule out the possibility of respiratory induced shock and heart failure. Cardiovascular centers are rarely involved. Norepinephrine should be used cautiously to avoid gangrene at intravenous site.

Feedings and Fluids.—Intravenous feedings are desirable initially to avoid possibility of aspiration. Effort should be made to avoid over-hydration with possible aggravation of cerebral edema. Great care should be exercised in administering gastric feedings containing too high a solute load to comatose patients because of the danger of producing dehydration, hyperchloremia and azotemia. Gastric hemorrhage and perforation are relatively common complications and can be prevented by the instillation of cream and antacids.

Prevention of Deformities.—Extremities should be put through a full range of motion several times daily to prevent deformities. We have also found hot packs to be useful in relieving pain and muscle spasm.

Hyperthermia.—Hyperthermia is the common cause of death in patients with encephalitis, apparently due to involvement of the hypothalmus. When aspirin fails to lower temperature, it is highly suggestive of disturbance of the temperature-regulating mechanism and is a signal for the most vigorous efforts to lower temperature, especially by lowering the environmental temperature.

Conclusions

This paper presents a brief review of the more common forms of encephalitis which are seen in infants and children in this region. A résumé of the treatment of these diseases is also presented.

1. Syverton, J. T.; Scherer, W. F., and Ellwood, Paul M.: Studies on the propagation in vitro of poliomyelitis viruses. J. Lab. & Clin. Med., 43:286-302 (Feb.) 1954.
2. Tobin, J. O'H.; Ellwood, P. M.; Syverton, J. T., and Brunner, K. T.: Proc. Cen. Soc. Clin. Res., 27:127, 1954.
3. Tobin, J. O'H.; Ellwood, P. M.; Syverton, J. T., and Brunner, K. T.: Poliomyelitis and aseptic meningitis. Bull. Univ. Minnesota Hosp. & Minn. Med. Found., 26:234-244 (Dec. 10) 1954.
4. Crevis, L., Seigel, N., and Henley, G.: Mumps meningoencephalitis with special reference to the use of the complement-fixation test in diagnosis. Pediatrics, 8:204, 1951.
5. Baker, A. B.: Secondary forms of encephalitis. Clin. Neurol., 2:740 and 786, 1955.
6. Adair, C. V.; Gauld, R. L., and Smadel, J. E.: Aseptic meningitis, a disease of diverse etiology: clinical and etiologic studies on 854 cases. Ann. Int. Med., 39:675-704 (Oct.) 1953.
7. Curnen, E. C.; Shaw, F. W., and Melnick, J. L.: J.A.M.A., 141:894, 1949.
8. Finley, K.; Longshore, W. A., and others. Western equine and St. Louis encephalitis: preliminary report of a clinical follow-up study in California. Neurol. J., 5:223 (April) 1955.
9. Shinefield, H., and Townsend, T. C.: Transplacental transmission of western equine encephalomyelitis. J. Pediat., 43:21, 1953.
10. Greenberg, Morris; Pellitteri, O., and Eisenstein, D. T.: Measles encephalitis. J. Pediat., 46:642 (June) 1955.
11. Shaw, E. V.: Clinical conference: measles enphalitis, J. Pediat., 40:383, 1952.
12. Applebaum, E.; Rachelson, M. H., and Dolgopol, V. B.: Varicella encephalitis. A.J.M., 15:223-230. (Aug.) 1953.
13. Livingston, S.: The Diagnosis and Treatment of Convulsive Disorders in Children. Pp. 49 and 283. Springfield, Illinois: Charles C Thomas, 1954.
14. Top, J. H., and Gordon, J. E.: Central nervous system in the course of scarlet fever. J. Pediat., 11: 677, 1937.

Current Concepts

HYPOTENSIVE DRUGS

WALTER F. KVALE, M.D.
Rochester, Minnesota

The number of drugs used in the treatment of essential hypertension has multiplied rapidly in the past three years. Despite use of many names, the four basic agents are (1) Rauwolfia serpentina, (2) Veratrum viride, (3) hydralazine hydrochloride and (4) the ganglion-blocking agents, hexamethonium and pentapyrrolidinium bitartrate. Contrary to the usual advertisement, treatment of essential hypertension is often difficult. However, many patients with essential hypertension can be treated successfully by use of one or more of these basic agents.

All these drugs have effects other than hypotensive. These effects may be minimal to severe and transient to persistent; every physician who treats essential hypertension should be familiar with them, as should the patient. The effectiveness of any hypotensive drug cannot be predicted. Thus, a trial of treatment is important. If one drug fails, another agent or a combination of drugs should be tried.

Rauwolfia serpentina is usually safe and easy to administer. Troublesome side effects are infrequent; they include nasal stuffiness, sedation, mild bradycardia, laxation and, at times, nightmares and agitated depression. The hypotensive effect of Rauwolfia may not appear for several days or weeks, as it is not a potent hypotensor. It is most effective in mild, labile hypertension and less so in severe hypertension. It characteristically induces a feeling of tranquility and well-being, without somnolence. Reduction in blood pressure is gradually induced and smoothly maintained. The drug is usually administered four times a day; after six to eight weeks, one or two tablets a day may suffice. Severe depression may occur with long-continued use.

Veratrum acts rapidly. The hypotensive effect begins about one-half hour after a single oral dose, reaching a peak in about two hours and diminishing over the next five to eight hours. Initially, a small dose is given after each meal and at bedtime. Each dose is gradually increased until satisfactory reduction of blood pressure is achieved or undesirable side effects occur. These effects are epigastric burning and hypotensive crisis, with increased salivation, hiccup, vomiting, bradycardia and circulatory collapse; they can be abolished by intravenous injection of atropine sulfate (1/120 to 1/60 grain). Results from preparations of Veratrum are unpredictable. Many patients cannot tolerate them in therapeutic doses; tolerance to their effect may develop. The range between their hypotensive and undesirable effects may be extremely narrow.

Hydralazine hydrochloride (apresoline) is a slow-acting hypotensor. It rarely reduces blood pressure to normal but, more commonly, to values approaching normal. It is usually used in combination with one of the other drugs. Initially, 25 mg. is given orally four times daily, with gradual increments of 25 mg. until 200 mg. is given four times daily or until reactions occur. The blood pressure of some patients is satisfactorily reduced with smaller doses. Some persons can tolerate the side reactions of apresoline. In others, reactions may be controlled by use of acetylsalicylic acid, tripelennamine hydrochloride (pyribenzamine) or phenobarbital with each dose. Side effects from apresoline are common. The immediate ones are headache, tachycardia, dyspnea, paresthesia, nervousness, dry mouth and depression. Some reactions disappear with continued administration of the drug or reduction of dose. Later side effects (weeks to months) are chills and fever, swelling of the legs, arthritis similar to rheumatoid arthritis and a syndrome simulating acute lupus erythema-

(Continued on Page 188)

From the Section of Medicine, Mayo Clinic and Mayo Foundation.

The Mayo Foundation is a part of the Graduate School of the University of Minnesota.

Laboratory Aids

Sponsored by
The Minnesota Society
of Clinical Pathologists
George G. Stilwell, Editor

IS IMMUNITY TO TRICHINOSIS BEING NATURALLY ACQUIRED?

JOHN H. THOMPSON, JR., Ph.D.
Rochester, Minnesota

In spite of the fact that trichinosis has been recognized for centuries, its practical control and the ability to diagnose the disease and to treat it successfully remain about as unsolved as they were a century or more ago. Both hogs and man continue to acquire the disease and no specific or nonspecific treatment appears to affect its course. The protean nature of the symptomatology of trichinosis and the ease with which it may be confused with numerous other conditions are well known. No less confusing is the problem of diagnosis from the clinical or laboratory standpoint.

Diagnosis

Numerous immunologic tests done at various stages of the infection apparently have contributed little toward early confirmation of a clinical diagnosis. In addition to the laborious techniques involved in preparing satisfactory materials for immunologic procedures, there are the ever-present questions of interpretation of results. Little question exists that opinions differ on such interpretations or that results of such procedures frequently are misleading. Even the classic eosinophilia so often referred to in the literature as a cardinal diagnostic feature may be lacking or may be a manifestation of other parasitic infections or of nonparasitic disease.

The possibility of direct microscopic demonstration of *Trichinella spiralis* by means of biopsy examination of muscle from the person suspected to have trichinosis has much to offer in the confirmation of a clinical diagnosis. Furthermore, a combination of examination of pressed tissue and digestion of this tissue performed on suspect meat eaten by the patient may provide the earliest and most valuable information available to the clinician. These procedures can be done quickly and require little laboratory equipment.

Examination of pressed tissue is done best by use of heavy glass plates mounted in metal frames that can be squeezed together by means of clamps or a bolting device so that the muscle being examined between the plates is pressed out to reveal its fiber structure clearly under observation at a magnification of 100 times. Many such devices have been described and illustrated in standard laboratory texts.

The material for biopsy should be taken from the pectoralis major muscle at the anterior fold of the axilla. This muscle is selected because it is the most readily available one having the greatest chance of being invaded. The diaphragm and the muscles of the thorax are involved most frequently. Such material should be examined in its entirety and the results must not be regarded as negative without careful scrutiny of all portions. If large pieces of muscle are available, digestion should be carried out after direct microscopic study of the material to reveal any organisms that may have been missed because of their position in the muscle. The sediment in the centrifuged digestion tube then can be examined microscopically for the typically motile larvae of *T. spiralis.* The materials for preparation of the digestive fluid and the apparatus used in this procedure are delineated in the technical appendices of most laboratory manuals.

While it is true that in 1956, as in former years, little other than supportive treatment is available for the person who has trichinosis, early diagnosis is important. There is always the possibility of reducing the degree of infection by purgation of such patients, provided one is equipped to examine material brought to the laboratory. The life cycle of the parasite of trichinosis is such that a

---

From the Section of Clinical Pathology, Mayo Clinic, Rochester, Minnesota.

This is the thirty-sixth in a series of editorial reports sponsored by the Minnesota Society of Clinical Pathologists and designed to foster closer relationships between clinicians and pathologists.

period of several days occurs during which intensive purgation can be of value in dislodging worms that ultimately would produce thousands of migrating larvae. The invasion of the tissues by such larvae produces the symptoms of the later stages of the disease. If these larvae are present in sufficient numbers, the infestation can be fatal. Unfortunately, it is true that most of the adult organisms in the intestine have disappeared when larvae are present in the muscles, but adult forms often persist in experimental animals for a long period and continue to give birth to larvae. This probably also is true in human disease.

Immunologic Aspects

It is all too apparent, however, that the message of public-health officials and others has not been taken from the lecture room to the dining room. While it is true that the mortality rate in this country is less now than that recorded in former times, evidence from various samplings of our population demonstrates an incidence of infection of 10 to 20 per cent. Moreover, occasional outbreaks of the disease still appear in which several persons die and numerous others are critically ill. Almost without exception these instances are referable to ignorance of or disregard for the basic facts concerning the proper handling of pork and pork products. A few moments spent occasionally by the family physician to explain to his patients the reason why Moses formulated his code of sanitation possibly might accomplish more than does the shotgun type of attack waged by the public-health official.

Needless to say, the persistence of infection with *T. spiralis* in both humans and hogs after years of effort to reduce it below the current incidence is cause for concern. However, one must not lose sight of the fact that most figures given for incidence are referable to zoologic infections, the figures being derived from post-mortem examination of persons who apparently had no history of clinical trichinosis. Moreover, extensive literature exists on experimental immunity to lethal doses of the larvae induced in animals by means of light zoologic infections. There is only slight reason to doubt that this same protective process is present in the human population, because little else can account for the relatively large incidence of infections revealed by post-mortem examination as compared to the small number of cases diagnosed clinically as trichinosis. Thus, the suggestion has been made that there is actual benefit in the persistence of the infections still found in man and hogs.

The actual proof of reinfection of man by a second exposure to Trichinella larvae subsequent to a light zoologic infection has not been demonstrated. Nothing has been reported in the literature to prove that man does not acquire the same type of protective immunity found in experimentally infected animals. Indeed, there is much evidence that he does. The development of serologic immune reactions in man after infection strongly points to such a result. The lack of clear evidence at necropsy of the existence of both early and late infections in the same person, when so many zoologic infections have been observed, strongly suggests the development of an absolute immunity.

Keeping in mind the possible role of acquired immunity to lethal doses of Trichinella in the general public, one must recall the question raised thirty years ago with reference to the careful evaluation of the more recent proposal to irradiate pork for human consumption. Such a process doubtlessly renders pork free of infective Trichinella, at least in the sense that encysted larvae exposed to such irradiation are sterilized and incapable of reproduction. However, evidence exists that ingestion of such irradiated larvae does not produce immunity to subsequent doses of small numbers of larvae. Animals fed irradiated larvae have been found to be as susceptible as control animals when they are fed challenging doses of normal, nonirradiated larvae.

These experiments suggest that use of such irradiation might result in gradual loss of the protective aspects of the present incidence of zoologic infections. This, together with the sobering fact that there is still no specific treatment for the disease, could result in an increase in clinical trichinosis in both man and hogs, with consequent morbidity and mortality rates comparable to those in earlier records.

When one tampers with natural processes, he may sow a wind and reap a whirlwind.

Editorials

JOHN F. BRIGGS, M.D.
ARTHUR H. WELLS, M.D.
HENRY G. MOEHRING, M.D.

WHAT ABOUT READING?

In any professional field one of the greatest challenges faced by the worker is keeping abreast of current developments. Medicine, as one of the swiftest moving of the modern professions, presents an almost overwhelming problem in this regard. Yet many doctors handicap themselves unnecessarily in this struggle to keep up with the swiftly flowing currents of their profession. This handicap results from their failure to exploit the potential which they certainly possess for more effective reading.

No doctor needs to be reminded of the constant flow of reading material across his desk. Correspondence, reports, research papers, newsletters, and professional journals constantly accumulate in his basket and his briefcase. That which *must* be read somehow gets read; much that *should* be read does not.

No figures are available on the amount of time spent by medical doctors in reading each day, but it probably corresponds pretty well with the figures derived from studies of the business and industrial executive group. These studies show that the typical executive spends from two to four hours of each work day in doing his necessary reading.

In addition to this mass of work-type reading, consider the amount of general material which could also contribute to personal and professional development. *Publisher's Weekly* reports that in 1955 alone our presses ground out 12,000 different titles. *Ayer's Directory* lists about 2,000 daily and 10,000 weekly newspapers as well as 1,600 weekly and 4,200 monthly magazines.

No sane person would suggest that anyone could (or should) read any great proportion of this bulk. However, it is obviously desirable to do more of it than current studies show is being done.

Naturally, the physician reads more and reads better than a cross-section of the general population. But this is as it should be. Background, experience, and intelligence all tend to favor the professional man as a reader. The disconcerting fact is that this superiority is not nearly as great as it should be. Even given attributes which tend to provide an ideal climate for effective reading, he surpasses the typical adult by only a minor degree in the rate and comprehension of reading.

Recent experience and research have demonstrated time and again that average readers can become superior readers and that superior readers can further extend the margin of their superiority.

Such gains may be achieved through the use of a great variety of aids currently available. The biggest drawback to this individual approach is that it often lacks the regularity and discipline leges and universities offer courses of training in needed to effect the desired changes. Many col- reading efficiency at the extension level. Most have consistently achieved desirable results in the needed directions.

The accelerating rate of advance in the field of medicine will no doubt make it mandatory for more and more doctors to take advantage of this type of assistance.

EUGENE S. WRIGHT
Department of Rhetoric
University of Minnesota

SYPHILOLOGY

Recent years have seen medicine develop into sometimes broad and sometimes narrow fields of specialization. As each new specialty establishes its certifying board, the event is heralded by both warmth and coolness. Medical progress is hailed on one hand and the trend to "super-specialize" decried on the other. Events of recent years may be foretelling the possible disappearance of a once busy specialty—that of syphilology. Three journals once devoted a major portion of their pages to this field. Two *(The Journal of Venereal Disease Information* and *The Journal of Syphilis, Gonorrhea and Venereal Disease)* of these have been discontinued and one *(The Archives of Dermatology and Syphilology)* has abandoned the latter half of its title. The Academy of Dermatology and Syphilology was renamed in December, 1954. In June, 1955, the section of the AMA devoted to diseases of the skin and syphilis likewise was reconstituted since, according to a resolution passed by the House of Delegates . . . "the incidence of syphilis is decreasing and the need for specialized care by dermatologists in the treatment of patients with syphilis is decreasing."

These events are noteworthy and demonstrate the effectiveness of the various public health measures instituted to control venereal diseases. Penicillin has also contributed in a large measure to these changes. Despite these changes, syphilis has by no means been entirely eliminated. The number of persons under treatment for syphilis in the United States in 1954 was 1,921,000, and of these, 86,500 were new cases. Of the new cases, 7,688 were infectious and 7,234 were congenital. Furthermore, in forty-three of the forty-eight states, there has been a steadily increasing incidence of new cases in recent years. Although we have the advantage of more stable peacetime population groups and an effective therapeutic agent, other factors counter-effect these. Large numbers of our youths are still in uniform; interstate and intercontinental travel steadily increases. All of these call for more vigorous employment of time-proven public health measures. Unfortunately, in 1953 there was a sharp curtailment in federal funds for these activities. This has placed the responsibility for these measures in the hands of the state, the community and the individual physician.

The physician, as always, is either the strongest or the weakest link in the chain. Before the advent of penicillin, the hazards of arsenical therapy and the prolonged treatment schedules forced many patients into either public health clinics or a syphilologist's office. In these situations, the case-finding and case-holding efforts were managed by organizations and individuals devoted to these functions. Penicillin, conspicuously with less risk and administered easily over a shorter period of time, is correctly administered by the family physician in his office. Unfortunately, with the conclusion of the injection schedule, the patient is dismissed. This despite the known failure rate of 10 per cent in early syphilis treated with penicillin. Furthermore, little effort is expended in determining the initial source of infection. Contact investigation is not employed. Cases of known treated infections are not reported to the public health authorities of our communities. Case finding and case holding remain the more important responsibilities of the individual physician who assumes the responsibility of treating syphilis.

Robert F. Tilley, M.D.

DOES THE PHYSICIAN NEED AN ARCHITECT?

Yes, no matter what building project interests the doctor, he needs professional planning service that only the architect can provide. In the construction of large hospitals, there is always an architect responsible for the design and construction. This is not always so, for many projects such as small clinics and residential work.

Why is this so? Perhaps an understanding of what the architect does will help. For instance, many people think the architect obtains work by bidding. To the contrary, he is engaged by direct selection or comparative selection by the client on a standard fee basis. Then contractors bid on drawings produced by the architect. By definition an architect is a master builder who professionally plans buildings and supervises their construction. To the durability, adequacy and convenience of a building, he adds that intangible ingredient—good design.

So, then, the physician and the architect are specialists in their respective fields. The contractor-builder is a very necessary part of the team—but not as a designer. Analogous to the nursing profession—certainly a member of the team, but not as a diagnostician or surgeon. The architect like the physician is prohibited from advertising by a code of ethics. The architectural graduate, too, requires his "internship" working in an architect's office several years before being permitted to take his registration examination. And like the medical profession, the architect also has his professional society, the American Institute of Architects.

Any physician would be hesitant to recommend a mid-wife when an obstetrician is readily available. Just as every patient is an individual case, so every building project is a special solution, and today the values of good architecture designed by architects are all around us.

Today, the architect is pioneering in a profession dedicated to better living. He has come to a clear conclusion: for an architectural form to have really lasting appeal it should—above all—make the fullest and best natural use of its materials. His work in designing airports, terminals, hospitals, shopping centers and similar types of modern building reflects today's dynamic architecture as it deals with the movement of people, flow of traffic, requirements of a generation on-the-go.

The architect, through a job well done, every day shows clients and others the saving graces of a well-designed, practical building—and to be practical means to serve in every respect, every direction. He is shouldering a full moral responsibility for building new cities measured to progress.

Robert E. Howe, A.I.A.
Architect

PRESENT STATUS OF VETERINARY MEDICINE

Ever since animals were first domesticated in the pre-dawn of civilization, men associated with them have tried to cure their ills and relieve their suffering. Like the barber shop which was traditionally the birthplace of surgery as applied to man, the first beginnings of veterinary surgery and medicine by persons making a specialty of those activities probably occurred in the blacksmith shop across the street. Doubtless, approximately the same knowledge, skill and sanitation were applied in both establishments.

The real beginnings of modern veterinary medicine, however, were brought about through military necessity. Disastrous immobilization of armies due to sickness and disability of transport animals, resulted in the establishment of schools of veterinary medicine and research into causes and treatment of diseases of animals.

From this meager beginning, veterinary medicine has grown to its present status among the learned professions. Changing economic conditions resulting in greatly increased concentration, transportation and value of domestic animals, has made control of disease a prime necessity. Veterinarians have met this challenge and have made it possible to produce animal products so vital to our economy, on a scale undreamed of half a century ago.

The realization, years ago, that many diseases of domestic animals are transmissible to man, has increased the responsibility of the veterinarian in his relations with other branches of medicine. This challenge has also been met by the profession. Especially trained veterinarians now have their place in most public health organizations. But more important is the responsibility assumed by most practicing veterinarians to promptly report and to participate in the control of dangerous diseases transmissible to man.

Today, a degree in veterinary medicine requires six years of university training, comparable in all respects to that required for graduation in other branches of medicine. The veterinary profession maintains ethical standards on a par with medicine, and veterinarians suffer in no respect when comparing their basic knowledge and technical ability with men in other medical fields. Moreover, they realize that vast fields of medical knowledge yet remain untapped and that maintenance of their present standards requires continued growth, with the same humility and devotion to duty which has marked their progress in the past.

Membership in the veterinary profession of today is a position of trust which any man may well be proud to assume.

Ralph L. West, D.V.M.,
Secretary and Executive Officer
Minnesota Livestock Sanitary Board

HOMEMAKER SERVICE

The Family Service homemaker service is planned to keep children in their own homes when the mother is out of the home temporarily for physical or mental illness. The Service maintains a staff of fifteen women who go into homes for several weeks to take care of the children during the mother's illness. Family Service pays these women by the hour.

The family receiving homemaker service pays the agency. They may pay full cost or part, depending on the income and size of the family. This is a costly child-care plan and is given only when there are two or more children in the home.

The father must make application for this service and a financial plan must be worked out before the homemaker is placed. A written recommendation is required from the physician, which gives some indication of the type of illness and an estimate of the length of time the homemaker will be needed. If the illness is of long duration such as tuberculosis, heart cases and the like, a homemaker is placed for a short time. During this time, the caseworker helps the father make plans for long-time care of the children.

If there are several very young children or an infant, it may be necessary to place the children in boarding homes instead of using homemaker service. Most of the homemakers can work only eight hours a day. The care of young children

---

Seventh editorial in a series on Family Service of Saint Paul, a Community Chest agency.

at night places too great a burden on the father.

The money available from the Community Chest for this service is limited. The refunds from families in 1954 was approximately 13 per cent. The hourly wage paid to the homemaker varies from $1.05 to $1.15, depending on the number of children in the family. There are additional costs such as transportation, insurance and social security for the homemaker.

This program was developed to help families at a point of crisis to keep children in their own homes. If the illness is of long duration, the Service keeps the family together until the father can make arrangements for long-time care.

Homemaker service, like all others offered by Family Service, is available to families living in the Community Chest area which is Ramsey County and West Saint Paul.

(Mrs.) Lois Hoffman
Director of Case Work Services

THE CHANGING PATTERN OF BANK LOANS

The pattern of banking in recent years has been essentially one of change. Especially in the field of loans have changes been made to keep pace with people's needs.

The development of personal credit, primarily to finance the purchase or improvement of homes, purchase of autos and home furnishings, has been typical. Twenty-five years ago, such loans were rare items on a bank's ledger, and installment loans to individuals were almost unheard of. Today, by contrast, more than one-half of the total dollar amount of loans in our bank are made to individuals as opposed to business firms. Two-thirds of these are on a monthly installment basis. The reasons for these changes are simple. They suit the customer's needs, and they are good business for us.

A similar condition prevails in the area of business loans. The types of customers and loans both have changed in these years. New industries like natural gas pipe lines, electronics manufacturers, and chemical companies have replaced others. Long-term credit is common now, whereas "90-day notes" were the unalterable lending device of yesterday. Many loans are made today which look to the projected cash earning power of a business for repayment rather than simply the seasonal liquidation of its inventory or accounts receivable.

Of the many types of loans which a modern bank is eager to make to individuals, the following, though not an exhaustive list, might be of particular interest to professional people:

1. *Real Estate Loans*—made to finance the purchase, construction, or improvement of homes and commercial property. These can be made either on a conventional mortgage basis or with the additional insurance and guarantees of FHA and VA.

2. *Monthly Payment Budget Loans*—used for the purpose of purchasing automobiles, home appliances, or for any other reasonable personal need. Budget loans are frequently made on the borrower's signature only.

3. *Equipment Purchase Loans*—Doctors establishing their practice or extending their equipment facilities frequently find it convenient to finance such purchases, by monthly installments, over an extended period, such as three years.

4. *Single Payment Loans*—loans of this type are frequently made when the customer anticipates being able to repay the advance at one time. They are used for meeting tax payment deadlines, temporary financing to facilitate changing residence, or handling any other unusually heavy expenses. These loans are often secured solely by the customer's signature, but in some cases the bank may ask for the pledge of additional collateral. This may be in the form of almost any readily negotiable personal property. Incidentally, the borrower can usually command a more favorable rate of interest when he supports his loan with a collateral pledge.

These are examples of the changes in bank loaning services referred to at the outset. Perhaps the chief characteristic of modern bank loaning policy is "flexibility." In summary, almost everybody's reasonable borrowing requirements can be attended to quickly and satisfactorily in "today's banks."

Burton N. Noah
Assistant Cashier
The First National Bank of Saint Paul

ALCOHOLISM

The alcoholic isn't just the "bum in the gutter," but he may be John, Mary, Joe—my friend, relative, attorney, accountant, housewife, laborer, every known type of person and of every profession.

Rehabilitation and prevention are costly, but neglect is even more so. Neglect of attention to such a devastating illness runs into the billions of dollars in lost work time, lowered production, loss of trained personnel, waste of public funds in taxes that go for relief, state hospitals, clinics, emergency wards, missions and lodgings, courts and jails, and public welfare services. The appalling waste in human lives, broken homes, and abandoned children is beyond calculation.

The most important recent advance in treatment of alcoholism has not been the discovery of any new cure or wonder drug, but the spread of a more enlightened attitude toward the problem among both the medical profession and the general public.

The Citizen's Commission on Alcoholism of Minnesota, through its offices at 600 Lumber Exchange Building in Minneapolis and its seventy counseling centers throughout the state, carries on an extensive campaign of education by all media at its command to erase the stigma of alcoholism; to make known to professional people as well as to the general public the unbiased, scientific facts about alcohol and alcoholism; to stimulate the establishment of more treatment facilities; to encourage physicians and hospitals to accept alcoholics for treatment; to provide schools and colleges with material to use in their educational programs.

This type of campaign of education acts as a preventive measure by increasing the awareness to the symptoms of alcoholism and thus helps those afflicted to seek treatment in the early stages of the illness.

Paul S. Rahneff, *Executive Secretary*
Citizens' Commission on Alcoholism,
of Minnesota, Inc.

In Memoriam

WILLIAM FRANK MAERTZ

Dr. William F. Maertz, former New Prague physician and civic leader, died January 3, 1956, at the age of seventy. At the time of his death, Dr. Maertz was a member of the staff at St. Peter State Hospital.

Born in New Prague, Dr. Maertz attended schools there and St. John's University; in 1908 he graduated from the medical school of the University of Minnesota. He interned at Minneapolis General Hospital and in 1909 started his practice in New Prague. He remained there until 1945, except for a period of service as a captain in the Medical Corps during World War I and a few years practicing medicine in Lidgerwood, N. D. While in the army, he was battalion surgeon for the 20th Engineers in France.

Dr. Maertz served as president of the Scott-Carver County Medical Society and was a member of the Minnesota State Medical Association and the American Medical Association. He was a member of Alpha Kappa Kappa fraternity.

He was a charter member of the Charles Borak Post No. 45 of the American Legion and served as first post commander. He was a delegate to the first national convention and in 1929 was Commander of the Third District.

Dr. Maertz was mayor of New Prague from 1920 until 1922 and held many offices in civic organizations, including the Community Club, the Catholic Workman, and Knights of Columbus.

He is survived by his wife; three daughters, Mrs. C. L. Cain of St. Paul, Mary Ruth of St. Peter, and Mrs. Robert Turner of Alexandria; his brother, Dr. B. L. Maertz of Willmar; and his sister, Mrs. John J. Kovarik, of Buffalo, New York. His son, Dr. Richard Maertz, preceded him in death.

ACCIDENTAL GUNSHOT WOUNDS

(Continued from Page 160)

of the arterial injury is indicated as soon as the shock phase has been corrected. Nerve injuries of the extremities should not be attacked as a primary problem but should be permitted to be repaired electively within a period of two weeks.

Prevention

A primary consideration in gunshot wounds is their prevention. Physicians in each community have the opportunity to emphasize and reemphasize to their fellow citizens the necessity of careful care in the handling of firearms. Through the cooperation of sportmen's clubs and civic organizations, the physician can bring to the attention of his community the morbidity and mortality associated with gunshot accidents. Simultaneously, he may stress the principles of first aid as applied to such injuries when they do occur.

President's Letter

SURVEY ON NATION'S PHYSICIANS

No doubt you have all been reading the results of the recently published survey on what the public thinks of the nation's physicians. It should be emphasized that although the AMA approved the questionnaire, the public, individual doctors, and the research agency really established the issues.

Interviewees were selected so that the proportion of people from various age, economic, geographical, and other groups matched the proportion of such people in the whole population; questions about general public attitudes were asked only of private individuals.

Some interesting major findings were revealed. One is that most Americans, 82 per cent, have a family physician. And they have a much higher opinion of their own physicians than of the medical profession as a whole.

Only 19 per cent said it was hard to reach their own doctors in an emergency, but 51 per cent thought it was true of doctors generally. Only five per cent said their own doctors were too quick to recommend an operation, but 31 per cent thought it was true of the profession as a whole.

What people like about their doctors and expect from them, it appears, is sympathy, patience, and understanding: not guaranteed cures and "wonder drugs." Eighty-seven per cent thought their own doctors take sufficient personal interest in their patients but, again, only 54 per cent thought this true of the profession in general.

Among those interviewed 43 per cent thought most doctors charge too much, but only 16 per cent thought this was true of their own physicians. About 30 per cent believed "most doctors plan to get rich quick," but only 10 per cent thought this was true of their own doctors.

The basic purpose of this survey was to find out what might be needed to improve doctors' services. If it is to have a value beyond that of the ordinary statistical gimmick, each one of us must act as judge to see if any of the criticisms made in this survey of doctors in general can be applied to ourselves. The whole undertaking will have been futile if the results are not heeded and, certainly, the best guarantee for continuing our tradition of free enterprise in medicine will be to satisfy medical needs as fully as possible.

In closing, let me say that we can be justifiably pleased by the praise many interviewees had for our profession. Apparently most adverse criticism of the medical profession is directed at some other person's doctor.

R. H. Wilson

President, Minnesota State Medical Association

Medical Economics

Edited by the
Committee on Medical Economics,
Minnesota State Medical Association
George Earl, M.D., Chairman

IOWA DECISION UPHOLDS DOCTORS

The Iowa court case between physicians and hospitals set forth this law: Hospitals cannot hire physicians and bill for their services, thereby engaging in the corporate practice of medicine.

To follow the salient features of the decision, first examine some of the factual conclusions of Judge C. Edwin Moore, who presided over the trial. Judge Moore said:

"The Court finds that pathology and radiology are recognized specialties in the practice of medicine."

* * *

"The Court further finds that laboratory medicine and radiology in their several branches are indispensable to attending physicians in modern medical care, and that facilities must be available in or near hospitals, and that the ownership and maintenance of laboratory facilities is an integral part of a modern hospital."

* * *

"The Court further finds that diagnostic x-ray and radioactive isotope procedures often provide the final diagnosis of the patient's ailment and that fluoroscopy undertaken by the radiologist has the same result, and that the written radiological diagnosis will usually be adopted by the attending physician as the final diagnosis in the case."

* * *

"The pathological and radiological diagnoses are available for acceptance by the attending physician just as are the diagnoses of other consultants in other medical specialties. In many instances, they are so accepted and become the final diagnosis in the case."

* * *

"The Court further finds the great weight of the opinion testimony offered herein establishes that the pathologists and radiologists are engaged in the practice of medicine in their activities as shown by the evidence."

Practice of Medicine Defined

One of the crucial points in the argument was a contention by counsel for the Hospital Association that pathologists and radiologists are not truly in the practice of medicine. Judge Moore cited two sections of the Iowa Code to refute the argument:

"PERSONS ENGAGED IN PRACTICE: For the purpose of this title the following classes of persons shall be deemed to be engaged in the practice of medicine and surgery:

"1. Persons who publicly profess to be physicians or surgeons or who publicly profess to assume the duties incident to the practice of medicine or surgery.

"2. Persons who prescribe, or prescribe and furnish medicine for human ailments or treat the same by surgery.

"3. Persons who act as representatives of any person in doing any of the things mentioned in this section."

"It is not confined to the administering of drugs. Under this statute, one who publicly professes to be a physician and induces others to seek his aid as such is practicing medicine. Nor is it requisite that he shall profess in terms to be a physician. It is enough, under the statute, if he publicly profess to assume the duties incident to the practice of medicine. What are 'duties incident to the practice of medicine?' Manifestly, the first duty of a physician to his patient is to diagnose his ailment. Manifestly, also, a duty follows to prescribe the proper treatment therefor. If, therefore, one publicly profess to be able to diagnose human ailments, and to prescribe proper treatment therefor, then he is engaged in the practice of medicine."

The Judge held that corporations cannot practice medicine, because they are not "persons" in the strictest sense. He pointed to this language used by the Iowa Supreme Court:

"The right to lawfully practice medicine in this state is a personal one. To attain such right, certain statutory requirements must be complied with."

"Medical practice acts are enacted for the protection of the public against the unskilled treatment of the sick or diseased by persons having neither the preparation nor the skill to diagnose diseases or to administer powerful and poisonous drugs. The welfare of the public is of the utmost concern in the enforcement of laws designed to guard and protect the public health. The merits of the secret formulas used in the treatment of cancer and other diseases is not of controlling importance in the decision of this case. Our concern is with the statute, which should be strictly observed."

Same Rules for Non-Profit Hospitals

The decision was reached solely on the basis of the law, and Judge Moore included this statement in his summation:

"The Court casts no reflections at plaintiff hospitals, but good motives do not provide immunity from the application of the statutes or the principles of law. The law applies to all and must not be violated even if the intention is only to do good."

He also said that most of the reasons given in the decisions condemning corporate practice generally are applicable to non-profit corporations.

Judge Moore also gave his opinion that the pathologist or radiologist, by permitting a hospital to bill for medical services in the name of the hospital without the consent of the patient or his legal representative, had violated the provisions of the Iowa Code dealing with "unprofessional conduct" and the division of fees.

Final Conclusions of the Court

The final Conclusions of Law were stated in this way:

> "It is the conclusion of the Court that under the facts established in this case and the law as the Court understands it, that the work done by the pathologist, radiologist, and the technicians working in the pathology and x-ray laboratories, constitutes the practice of medicine.
>
> "That under the Iowa law the privilege of practicing medicine is a personal one requiring qualifications which cannot be met by a corporation.
>
> "That the provisions of Chapter 135B (Iowa Code) do not grant hospitals any right to practice medicine by the operation of pathology and x-ray laboratories in the manner shown by the evidence.
>
> "That plaintiff hospitals are not excluded from the requirements of the Iowa practice acts in regard to the practice of medicine on the basis that they are non-profit corporations or because of long standing custom and inactivity on the part of those charged with enforcing the law, or because of public policy in the absence of legislative enactment.
>
> "The Court does not intend that any findings or conclusions herein affect in any way the obligation of public hospitals . . . to provide medical treatment for indigent persons or tuberculous patients . . . wherein medical treatment is to be provided by hospitals of that category to patients of certain entitlement, nor as to the operation by the State of mental or other hospitals authorized by law.
>
> "The Court is not to be understood as holding the plaintiff hospitals cannot own and maintain facilities of pathology and x-ray laboratories and receive just compensation for the use thereof, as certainly these are essential and necessary parts of a modern hospital, nor that the operation of said laboratories within the law need affect the care and treatment to be given the patients.
>
> "It is the opinion of the Court that the furnishing of proper pathology and x-ray services to the patients in the hospitals can be worked out on the local level and within the law."

COLORADO AND IDAHO DECISIONS

That corporate practice of medicine is illegal was reaffirmed in two other states recently.

In Colorado, a suit by a chiropractic corporation was dismissed when the Judge held that the chiropractic corporation itself was illegal through its corporate "practice of medicine;" and therefore it had no redress in the courts.

This decision held that a state has the constitutional power to prohibit a corporation from practicing a learned profession. Regarding the question of whether a corporation can nonetheless still engage in the practice of a learned profession through its agents and employees who are themselves licensed to practice, the Colorado Supreme Court was quoted as clearly saying that a corporation cannot practice dentistry and that a corporate hospital cannot practice medicine or surgery.

The decision read:

> "If the reason for the rule that a corporation cannot practice medicine is an expressed legislative desire to protect the public against unauthorized, unqualified and improper practice of the healing arts, and to maintain the personalized relationship between the healer and the patient, then whether a corporation was organized for profit or non-profit would be of no legal significance.
>
> "In a hospital the medical services of the interns and residents are only a small part of the total medical services rendered therein, most of the medical services being rendered by individual licensed practitioners who have placed their own patients in the hospital."

It was held that for a corporation to completely staff a hospital and through this staff to treat patients of the corporation was entirely different from usual hospital practice.

In Idaho, the Attorney General gave an opinion on the legality of a sample contract between a hospital and an anesthesiologist.

The contract was basically a percentage agreement between the doctor and the hospital corporation. The issue was whether the contract placed the hospital corporation in the practice of medicine because the physician-anesthesiologist was an "employee."

The Attorney General ruled that it did and advised that hospitals who employed physicians were engaged in the practice of medicine in violation of Idaho law. Also, that the actions of the doctor and the manner in which he would practice his profession could actually be controlled by the hospital under such conditions.

PRESIDENT'S 1956 HEALTH MESSAGE

The President's 1956 health message contained no real surprises. The multi-million dollar program, called "a partnership in which private and governmental enterprise are joined to advance the public welfare" included a request for an appropriation of $126,525,000 for basic medical research. The major share of the funds would go to medical schools, hospitals and private laboratories for their own research.

Congress was asked to authorize $250,000,000 to be spent in construction of research and teaching facilities for medical, dental and public health schools.

Federal reinsurance schemes have been dropped temporarily. An effort will be made to amend antitrust laws to enable private insurance companies to pool their risks, thus encouraging faster progress in extending coverage to older people, to those living in rural areas, to self-employed persons and in providing for catastrophic illness protection.

The President asked for extension for two years beyond June 30, 1957, of the federal-state program to help build public hospitals and other health facilities, and new authorizations of $19 million to carry this out. He also asked for extension of the water pollution act and an increase in funds to broaden the attack on problems of air pollution.

The administration requested that the act permitting federal gifts of polio vaccine to the states for free distribution to children and pregnant women be continued through June, 1957, with an appropriation of $30 million to complete this program.

Another recommendation was for $53 million for construction and improvements at Veterans Administration hospitals. During the 1957 fiscal year, it is expected that the average daily load of the veterans hospitals will be about 111,500 patients.

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

230 Lowry Medical Arts Building
Saint Paul 2, Minnesota

F. H. Magney, M.D., Secretary

SAINT PAUL QUACK SENTENCED TO WORKHOUSE FOR ONE YEAR

Re: State of Minnesota vs. Frank H. Gold, alias Dr. Frank Stone

On February 7, 1956, Frank H. Gold, thirty-eight, 129 W. Summit Avenue, Saint Paul, after entering a plea of guilty to a charge of practicing healing without a basic science certificate, was sentenced by the Hon. Arthur A. Stewart, Judge of the District Court of Ramsey County, to a term of one year in the Saint Paul Workhouse. The defendant had been charged in a criminal complaint issued on January 20, 1956, with making an examination of a Saint Paul woman, after representing to her that he was "Dr. Frank Stone," a heart specialist. Gold, who had been working as a salesman for an automobile company in Saint Paul, had in his possession at the time of his arrest a prescription pad which had the name "Frank H. Gould, M.D." printed across the top. In the car that the defendant had been using was found a large black medical bag which contained numerous drugs, salves, and lotions, an atomizer, hypodermic syringe and needle, stethoscope and also some surgical instruments.

Gold has never studied medicine but was employed for several years as an orderly at a hospital in New York City, and also worked in the same capacity for at least three hospitals in Minneapolis and Saint Paul. He has three previous convictions in Hennepin County District Court involving violations of the Basic Science Act. Gold was first arrested on May 18, 1946, by Minneapolis police officers for representing himself as a physician and surgeon. He pleaded guilty on May 21, 1946, and on June 12, 1946, was sentenced to a term of one year in the Minneapolis Workhouse. Because it was Gold's first conviction, the sentence was stayed and the defendant placed on probation. In March, 1948, it was learned that Gold was again practicing healing illegally by representing himself as a doctor of medicine. On March 8, 1948, Gold pleaded guilty to the charge and was sentenced by Judge Levi M. Hall to one year in the Minneapolis Workhouse. The defendant was again arrested on January 14, 1950, and on January 18, 1950, he entered a plea of guilty before the Hon. John A. Weeks, Judge of the District Court, to an information charging him with the crime of practicing healing without a basic science certificate. Judge Weeks sentenced Gold to serve one year in the Minneapolis Workhouse. The basis of the charge was that Gold had been representing himself as "Dr. Frank H. Gould" and that he had requested one of the Minneapolis drug stores to print some prescriptions for him and after receiving the prescriptions wrote several. The prescriptions were questioned by a pharmacist which led to Gold's arrest.

Gold was also convicted in 1951 in Federal District Court in Saint Paul of several violations of the World War II Servicemen's Readjustment Act of 1944 for illegally obtaining certain benefits under the act and also for making false statements in doing so. On September 4, 1951, Gold was sentenced by the Hon. Robert C. Bell, Judge of Federal District Court in Saint Paul, to pay a fine and also to serve a one-year term in prison.

The Dean's Page

EDUCATION FOR GENERAL PRACTICE

The increase in medical specialization over the past quarter century has given rise to concern as to an adequate number of family physicians who, it is agreed, provide the basic foundation of good medical service and are able to care for the vast majority of their patients' medical needs. In fact, it has been feared by some that the specialists on the teaching faculties of medical schools may by their very presence encourage students to specialize rather than enter general practice. Actually, medical faculties are thoroughly cognizant of the importance of the family physician and make conscious efforts to set up their teaching programs for the specific purpose of giving their students the best *general medical education* possible, limiting the teaching of the specialities to what the general physician should know. This much we have known. The question is "What has been the result?" A special comprehensive study recently released by Dr. Frank Dickinson, Director of the AMA's Bureau of Medical Economic Research, presents significant information on this point. What Doctor Dickinson has done has been to analyze the data in the AMA Directory of Physicians by type of practice and school and year of graduation.

For the University of Minnesota, this report shows that of the 2,432 physicians who were graduated between 1930 and 1950, 44 per cent are engaged in general practice, 6 per cent are part-time specialists, 23 per cent are full-time specialists, and 27 per cent are not now in private practice. Some of this latter group are in military service and some in residencies. Of all the physicians in active practice who were graduated from medical schools in the United States between 1930 and 1945, 46 per cent are in general practice. For the University of Minnesota graduates, the corresponding figure is 54 per cent in general practice; for the University of Iowa, 46 per cent; for the University of Kansas, 52 per cent; for the University of Nebraska, 53 per cent; for the University of Colorado, 44 per cent; for the University of Wisconsin, 45 per cent; for the University of Illinois, 49 per cent; for the University of Michigan, 34 per cent, and for Northwestern University, 38 per cent.

It is interesting to note also that the number of Minnesota graduates who entered general practice was 41 per cent for the five-year period, 1930-34; 40 per cent, for 1935-39; 48 per cent, for 1940-44; and 46 per cent for 1945-49.

There are other aspects of Doctor Dickinson's report which merit further study, but the above figures indicate that the University of Minnesota is not doing badly in educating general physicians and that among recent graduates of this medical school there is no trend away from general practice into specialization.

—Harold S. Diehl, *Dean*
University of Minnesota Medical School

Reports and Announcements

MEDICAL MEETINGS

State

Minnesota State Medical Association, annual meeting, Mayo Civic Auditorium, Rochester, May 21-23, 1956.

Minnesota Society of Obstetrics and Gynecology, spring meeting, Radisson Hotel. Minneapolis, April 12-14, in conjunction with meeting of American College of Obstetricians and Gynecologists. Secretary, Dr. Edward A. Banner, Rochester.

Minnesota Surgical Society, spring meeting, Rochester, May 11. Secretary, Dr. Owen G. McDonald, Duluth.

Northwest Pediatric Society, spring meeting, Rochester, May 22, in conjunction with meeting of Minnesota State Medical Association. Secretary, Dr. T. C. Papermaster, Minneapolis.

National

American Association of Blood Banks, ninth annual meeting, Somerset Hotel, Boston, Massachusetts, September 3-5. Secretary, Marjorie Saunders, 725 Doctors Building, 3707 Gaston Ave., Dallas, Texas.

American Cancer Society and National Cancer Institute, Third National Cancer Conference, Sheraton-Cadillac Hotel, Detroit, Michigan, June 4-6. Write National Cancer Conferences Coordinator, American Cancer Society, 521 West 57th Street, New York 19, New York.

American College of Gastroenterology, Southern Region, Louisiana State University School of Medicine, New Orleans, Louisiana, April 8. Secretary, American College of Gastroenterology, 33 West 60th Street, New York 23, New York.

American Goiter Association, Drake Hotel, Chicago, Illinois, May 3-5. Secretary, Dr. John C. McClintock, 149½ Washington Ave., Albany, New York.

American Ophthalmological Society, Hot Springs, Virginia, May 31 to June 2.

Gill Memorial Eye, Ear and Throat Hospital, twenty-ninth annual Spring Congress, Roanoke, Virginia, April 2-7.

Industrial Health Conference, sponsored by organizations of industrial physicians, dentists, nurses, hygienists and government agency workers, at Convention Hall, Philadelphia, Pennsylvania, April 21-27. Write Industrial Health Conference, 28 East Jackson Boulevard, Chicago 4, Illinois.

Medical Library Association, fifty-fifth annual meeting, Hotel Statler, Los Angeles, California, June 18-22. Write Mrs. Ella Crandall, Librarian, Los Angeles County General Hospital, 1200 North State Street, Los Angeles 33, California.

Oregon Academy of Ophthalmology and Otolaryngology, fifteenth annual Spring Convention in Ophthalmology and Otolaryngology, University of Oregon Medical School, Portland, Oregon, March 19-22.

International Meetings

Canadian Medical Association, Quebec, Canada, June 10-14. Secretary, Dr. Arthur D. Kelly, 150 St. George St., Toronto, Ontario, Canada.

Congress of International Anesthesia Research Society, Miami Beach, Florida, April 9-12. Write Dr. R. J. Whitacre, 13951 Terrace Road, Cleveland, Ohio.

Congress of International Society of Hematology, Hotel Somerset, Boston, Massachusetts, August 27 to September 1. Secretary, Dr. W. C. Maloney, 39 Bay State Road, Boston, Massachusetts.

Inter-American Congress of Cardiology, Havana, Cuba, November 4-10. Write Dr. Ramon Aixala, Apartado 2108, Havana, Cuba.

International Academy of Pathology, Cincinnati, Ohio, April 24 and 25. Secretary, Dr. F. K. Mostofi, Armed Forces Institute of Pathology, Washington 25, D. C.

International Academy of Proctology, eighth annual convention, Drake Hotel, Chicago, Illinois, April 23-26. Secretary, Dr. Alfred J. Cantor, International Academy of Proctology, 147-41 Sanford Avenue, Flushing 55, New York.

International Congress of Clinical Chemistry, Hotel New Yorker, New York, September 9-14. Secretary, John G. Reinhold, 711 Maloney Building, University of Pennsylvania, Philadelphia 4, Pennsylvania.

National Congress of Pediatrics, Cuidad Universitaria, Mexico D. F., Mexico, May 1-5, 1956. Dr. Ignacio A. Cisneros, chairman, Calzada de Madereros No. 240, Mexico 18, D. F., Mexico.

Pan American Medical Association, Tenth Inter-American Congress, Mexico City, Mexico, April 15-21, 1957. Executive director, Dr. Joseph J. Eller, 745 Fifth Avenue, New York, New York.

World Medical Association, Havana, Cuba, October 9-15. Secretary, Dr. Louis H. Bauer, 345 E. 46th St., New York 17, New York.

SCHERING AWARD COMPETITION

The eleventh annual Schering Award competition has been announced. Medical students are invited to select one of three subjects and submit papers in competition for a $500 first prize and a $250 second prize in each of the three subject classifications. Subjects for 1956 are as follows: (1) The Clinical Use of Adrenocortical Steriods in Collagen Diseases, (2) Metabolic Aspects of the Aging Process, and (3) New Applications of Antihistamines in Medicine and Surgery.

Information and entry forms are being distributed in medical schools. Students who wish to participate should submit entry forms before July 1, and manuscripts must be postmarked not later than September 30. The contest is sponsored by Schering Corporation.

WINONA COUNTY SOCIETY

Dr. W. O. Finkelnburg, Winona, was elected president of the Winona County Medical Society at a meeting of the organization at the Hotel Winona on January 9. He succeeds Dr. Philip Heise in the post. Named as vice president of the group was Dr. Sidney O. Hughes, with Dr. L. J. Wilson as secretary and Dr. W. W. Haesly as treasurer, all of Winona.

Dr. Lewis Younger, Fair Oaks, was named delegate to the state association. Dr. H. W. Satterlee, Lewiston, was named alternate.

The meeting was attended by twenty-one Winona County physicians and their wives.

ST. PAUL SOCIETY OF INTERNAL MEDICINE

The St. Paul Society of Internal Medicine will hold a meeting at the St. Paul University Club on April 19, at :30 p.m. Dr. M. E. Janssen will present a paper on "Paroxysmal Hemoglobinuria." Also on the program will be a discussion of the Blue Shield Plans A and B for major medical illness.

ST. PAUL SURGICAL SOCIETY

The next meeting of the St. Paul Surgical Society will be at the Minnesota Club in St. Paul on March 21, with dinner at 6:00 p.m. preceding the scientific meeting. The principal speaker will be Dr. Donald McCain.

AERO MEDICAL ASSOCIATION

The annual meeting of the Aero Medical Association will be held at the Drake Hotel, Chicago, Illinois, on April 16, 17, and 18, 1956.

This year's meeting will provide the most comprehen-ive review of current progress in Aviation Medicine ver presented. There will be 137 papers presented dealing with every aspect of the field and coming from military and civilian sources in nine countries.

Of particular interest will be the section meetings which will include in their agenda panel discussions of ital topics by top authorities in each field. Those sections convening will include the following sub-special-ies: Space Medicine, Civil Aviation Medicine, Avia-ion Physiology, Aviation Ophthalmology, Acceleration nd Deceleration. Air Passenger Transportation, Noise nd Vibration, Pilot Selection and Aviation Psychology, Personal Equipment, Aviation Pathology, Aviation Medical Education, and a combined symposium on Escape from High Performance Aircraft.

All members of the profession are cordially invited to attend any or all of these sessions.

The Wives Wing of the Aero Medical Association, composed of over 300 wives of Association Members, will hold their annual functions on the same dates. All wives of persons in the profession are also cordially invited to attend.

COURSES IN PEDIATRICS

The following short courses will be conducted at The Children's Hospital of Philadelphia in May and June, 1956.

1. Pediatric Advances for Pediatricians and General Practitioners. May 28 through June 1, 1956. A Refresher Course conducted by the Staff of the Children's Hospital of Philadelphia, in collaboration with the Department of Pediatrics of the University of Pennsylvania and the Camden Municipal Hospital. Tuition—$100.00.
2. Practical Pediatric Hematology. June 4, 5, and 6. Conducted by Dr. Irving J. Wolman and other members of the Hematology Department of the Children's Hospital, under the auspices of the Graduate School of Medicine, University of Pennsylvania. Tuition—$60.00.
3. Blood Group Incompatabilities and Erythroblastosis Fetalis. June 7 and 8. Conducted by Dr. Thomas R. Boggs, Jr., of the Philadelphia Serum Exchange of the Children's Hospital of Philadelphia, under the auspices of the Graduate School of Medicine, University of Pennsylvania. Tuition—$50.00.

For information, write to Irving J. Wolman, M.D., Children's Hospital of Philadelphia, 1740 Bainbridge Street, Philadelphia 46, Pennsylvania.

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

An examination for medical licensure will be given by the Minnesota State Board of Medical Examiners beginning Tuesday, June 12, 1956, continuing on Wednesday and concluding with a practical examination on Thursday, June 14, 1956. Candidates should have their completed applications, required credentials and fees on file thirty days prior to the examination.

CONTINUATION COURSES AT THE UNIVERSITY OF MINNESOTA

Center for Continuation Study

Dates	*Course*	*Guest Speaker*
March 19-21	Cardiovascular Diseases for General Physicians	Dr. Hans Hecht, University of Utah College of Medicine
April 7	Trauma for General Physicians	
*April 9-11	Endocrinology for General Physicians	Dr. Peter H. Forsham, University of California Medical School
*April 16-18	Radiology for General Physicians	
May 7-12	Electrocardiography for General Physicians	

*Dates changed since previous announcements.

Woman's Auxiliary

MOWER COUNTY AUXILIARY

Mrs. L. J. Leonard

Editor, Minnesota Medicine Auxiliary News

In response to my December request to county presidents for material to be used in MINNESOTA MEDICINE, I received a newspaper clipping from Mrs. Robert R. Wright, Austin, president of the Mower County Auxiliary. It was excellent publicity, consisting of five pictures and a news column covering their fifth annual effort in behalf of nurse recruitment and allied medical careers.

On January 23, the Mower County Auxiliary sponsored a tour of St. Olaf Hospital in Austin for 200 high school girls interested in these professions. The tour was followed by a tea at the local YWCA and several of the girls' mothers also attended.

Miss Miriam Berg and Miss Lois Atheson, instructors at the Methodist Kahler School of Nursing, Rochester, were speakers. They stressed the fact that hospital admissions had doubled since 1935, creating a constantly increasing need for medical personnel. They urged the selection of science courses in high school, with an emphasis on chemistry, as these subjects are important entrance requirements for admission to nurses' training schools. Those who would enjoy the service of nursing and have a good scholastic average should apply.

Other fields discussed were vocational nursing, medical technology, x-ray technology, occupational therapy, physical therapy and dietetics. A film, "When You Choose Nursing," was shown.

Mr. Peter Bye, assistant administrator at the hospital, conducted one of the tours and explained the use of the x-ray machine.

The news picture showed eighteen of the girls who attended, which was outstanding co-operation from the newspapers. A story like this has a great deal of local interest and is good public relations. In charge of arrangements were Mrs. Stanley Peterson, Mrs. E. C. Sargent and Mrs. George Stahl.

Letter to the Editor

Dear Editor:

I know that this is an unusual request, but I should appreciate any help that you can give me in this matter. I am attempting to locate a Miss Virginia McLoad who graduated from Pine Bluff High School in 1931 and who is a graduate nurse married to a doctor now practicing in Minnesota.

Both Virginia and her husband did medical work in Puerto Rico in the late '30s or early '40s. I know this is pretty scant information to go on, but I have exhausted all other sources of information.

Yours very truly,
LESTER SILBERNAGEL

Pine Bluff, Arkansas
January 17, 1956

HYPOTENSIVE DRUGS

(Continued from Page 173)

tosus. Such reactions can be completely reversed by discontinuing use of the drug.

Hexamethonium and pentapyrrolidinium bitartrate (ansolysen) are potent hypotensors and should be used only for severe hypertension. Treatment should be initiated with the patient under observation in the hospital, and the patient must learn to determine his own blood pressure and regulate dosage. The drugs can be given subcutaneously or orally but the oral route has been used with increasing frequency. The dosage varies greatly with each person. Initial oral doses of hexamethonium are 125 to 250 mg. of the salt before each meal and at bedtime; each day individual doses are increased by 125 mg. The maximal dose is 1,250 mg. four times daily. Initial oral doses of ansolysen are 20 mg. given in the same manner as is hexamethonium. Doses are increased by increments of 20 to 40 mg. and the maximal dose is 400 to 500 mg. four times daily.

Untoward side reactions of these ganglion-blocking agents are orthostatic hypotension, blurring of vision, constipation and urinary obstruction, especially in elderly men. A few patients have paralytic ileus, which necessitates discontinuance of therapy. Constipation, which is common, usually can be controlled by mild laxatives and sublingual use of neostigmine, 15 to 30 mg. one or more times a day. Nocturia and difficulty in urination may be relieved by sublingual use of bethanechol chloride (urecholine), 5 mg. one to three times a day. In some instances, transurethral prostatic resection must be performed or treatment with the drug discontinued. Impotence is common.

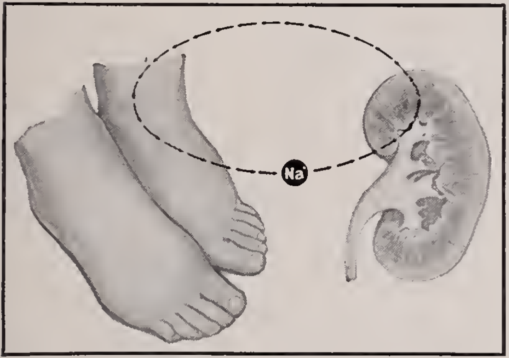
Treatment of essential hypertension by drugs is as yet not completely satisfactory. All available drugs have unpleasant and sometimes serious side effects. However, judicious and intelligent use of one or more of the agents mentioned will reduce blood pressure in most cases of essential hypertension.

The Savings Bonds sales program is truly an "All-American" program. Every participant can take pride in it. The savings—large and small—which have gone into this program have been building important financial reserves for our people which will enable them to enjoy a finer, more secure future. These investments are making a vital contribution to the sound management of our Nation's finances.—GEORGE M. HUMPHREY, Secretary of the Treasury.

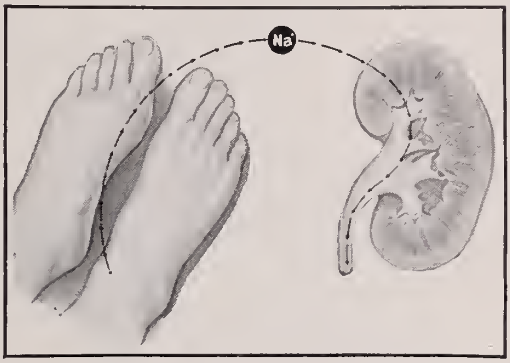
MICTINE* — ORAL NON-MERCURIAL DIURETIC

New Orally Effective Diuretic for Congestive Edema

Best results are obtained when Mictine is administered with meals on an interrupted dosage schedule.



WITHOUT MICTINE — *Prior to diuretic therapy excessive sodium and water are characteristically retained in the edematous patient.*



WITH MICTINE — *Inhibition of the reabsorption of sodium ion leads to an increased excretion of sodium ion, water and chloride.*

An effective diuretic has been described as one which causes excretion of water, sodium and chloride in amounts sufficient to reduce the edema but not to result in salt depletion.

Mictine (brand of aminometradine) introduces to clinical practice an *improved* diuretic which not only meets the standard qualifications but has these seven additional advantages:

Mictine is orally effective; it is not a mercurial; it has no known contraindications; it does not upset the acid-base balance; it exerts no significant influence on electrolyte balance; it may be given in the presence of renal or hepatic diseases; it is well tolerated.

As with most effective therapeutic agents, in high dosage Mictine may cause some side effects in some patients; however, on three tablets daily side effects (anorexia and nausea, rarely vomiting, diarrhea or headache) are minimal or absent.

Clinically, Mictine is useful in the maintenance of an edema-free state in all patients and for initial and continuing diuresis in mild or moderate congestive failure. It is not intended for initial diuresis in severe congestive failure unless either sensitivity or tolerance to other diuretics has developed in the patient.

The maintenance dosage of Mictine, as well as for initial diuresis in mild or moderate congestive heart failure, is one to four 200-mg. tablets daily in divided doses; the dosage for initial diuresis in severe congestive failure, under the conditions already described, is four to six tablets daily. For either use, it is recommended that Mictine be prescribed with meals on interrupted dosage schedules; that is, prescribing Mictine on alternate days or for three consecutive days and omitting it the next four days.

*Trademark of G. D. Searle & Co.

Descriptive literature and clinical trial packages are available on request to . . . **SEARLE** P. O. Box 5110, B
Chicago 80, Illinois

General Interest

Minnesota physicians are invited to submit items of "general interest" concerning themselves or their colleagues to Minnesota Medicine, 2642 University Avenue, St. Paul. Only the facts are needed—who? what? where? when? why?—since items will be rewritten for conformity of style.

* * *

Dr. A. B. Rosenfield, chief of the section of maternal and child health for the Minnesota Department of Health, Minneapolis, has been named to head an advisory committee on accident prevention. He was appointed to the post by the Minnesota Society for Crippled Children and Adults, which conducts an accident prevention program in public schools.

* * *

Dr. John Hult of the Raiter Clinic, Cloquet, has been made a diplomate of the American Board of Pediatrics. Dr. Hult has been practicing at the Raiter Clinic since July, 1954. Previously he was chief resident pediatrician for the University of Colorado Medical Center in Denver.

* * *

New chief-of-staff at St. Barnabas Hospital, Minneapolis, is **Dr. Lloyd F. Sherman,** who succeeds **Dr. Arthur H. Mork** in the post. Dr. Sherman has been a member of the staff since 1950. Other officers elected by the medical staff of the hospital include **Dr. William T. Walsh,** vice chief-of-staff, and **Dr. John T. Moehn,** re-elected secretary-treasurer.

* * *

Dr. Raymond D. Pruitt, Rochester, associate director of the Mayo Foundation, was one of the speakers at the fifty-second annual Congress of Medical Education and Licensure in Chicago on February 11 through 14. The meeting was sponsored by the Council of Medical Education and Hospitals of the American Medical Association.

* * *

Draft board orders for **Dr. John R. B. Fischer,** Blooming Prairie, were cancelled January 15 following a review of the city's medical situation. It was decided that his services were needed by the city, which has only one other physician, **Dr. Benedik Melby.** Previous to the draft call, issued by an out-of-state draft board, Dr. Fischer had been denied a commission in the armed forces due to physical handicaps.

* * *

Dr. Bernard E. O'Reilly has been elected president of the medical staff of St. Joseph's Hospital, St. Paul. Other staff officers elected include **Dr. C. L. Cain,** vice president; **Dr. Richard M. Leick,** treasurer, and **Dr. Hubert F. Flannery,** secretary.

Appointed chiefs of the major services are **Dr. John F. Briggs,** medicine; **Dr. Charles E. Rea,** surgery; **Dr. Joseph W. Goldsmith,** obstetrics-gynecology; **Dr. John E. Teisberg,** general practice, and **Dr. John J. Galligan,** pediatrics.

Dr. Charles W. Mayo, Rochester, has been appointed by President Eisenhower as alternate representative on the executive board of the World Health Organization. Dr. Mayo attended a meeting of the organization as a delegate last spring in Mexico City.

* * *

Principal speaker at a meeting of the Rotary Club in Minneapolis on January 27 was **Dr. Harold S. Diehl,** dean of medical sciences at the University of Minnesota. Dr. Diehl discussed international problems in the field of world health.

* * *

Dr. Malcolm B. Dockerty, Rochester, conducted a symposium on gynecology at a three-day sectional meeting of the American College of Surgeons at Jacksonville, Florida, January 16 through 18.

* * *

Dr. Jack V. Wallinga, formerly an instructor in child psychiatry at the University of Minnesota Medical School, was recently promoted to the rank of lieutenant commander in the Navy Medical Corps. Dr. Wallinga has been on duty with the neuropsychiatric service at Oak Knoll, U. S. Naval Hospital, Oakland, California, since August, 1954. He conducts a psychiatric clinic for disturbed young dependents of naval personnel.

* * *

Lt. Col. Harold G. Benjamin, Minneapolis physician since 1935, has assumed command of the 204th Medical Battalion, Minnesota National Guard. Headquarters of the battalion are in Minneapolis, with units in St. Paul and Zumbrota.

* * *

New chief-of-staff of the Olmsted Community Hospital, Rochester, is **Dr. John E. Verby,** a member of the Olmsted Medical Group in Rochester, who succeeds **Dr. T. O. Wellner** in the post. Other new staff officers of the hospital include **Dr. A. F. Risser,** Stewartville, vice president, and **Dr. E. W. Ellis,** Elgin, secretary-treasurer.

* * *

An emergency tracheotomy, performed at a dinner meeting of the St. Paul Surgical Society on January 25, saved the life of **Dr. Carl J. Fritsche,** New Ulm When he choked on a piece of meat during dinner and collapsed, unable to breathe, he promptly wa placed on the floor by **Dr. Howard A. Vogel** of New Ulm and **Dr. J. E. Schroeppel** of Winthrop. Then Dr **Nathan C. Plimpton,** Minneapolis, performed an emer gency tracheotomy, using a pen-knife. Able to breath again, Dr. Fritsche coughed and dislodged the obstruc tion. He was taken to St. Luke's Hospital for furthe care.

* * *

Dr. Ann W. Arnold has been elected president an chief of the medical staff of Ripley Memorial Hospita (formerly Maternity Hospital), Minneapolis. Other sta

Upjohn
KALAMAZOO

Indicated wherever oral cortisone or hydrocortisone is effective • Available in 5 mg. tablets in bottles of 30 and 100, and in 1 mg. tablets in bottles of 100 Usual dosage is ½ to 1 tablet three or four times daily

Delta-Cortef*

Less sodium retention, less potassium depletion

*Trademark for the Upjohn brand of prednisolone (delta-l-hydrocortisone)

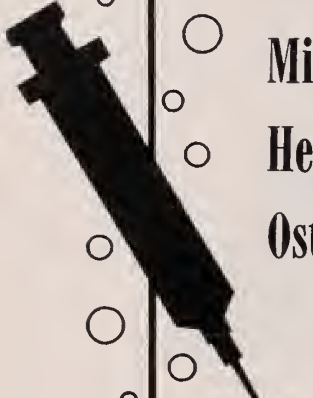
New STEELINE Pediatric Table

Eases the burden of the physician's daily work

Includes built-in tare balance scale, built-in measuring rod, foam rubber cushion and electrical outlets with cord and plug—there are no accessories to buy. Top quality construction features include all-welded steel body, two roomy drawers and a large open compartment with shelf, providing easy, unhampered access to instruments and supplies. Front edge is protected from wear by a stainless steel baffle plate. Despite the fact that this new table has been designed to provide the physician with the best modern equipment, efficient modern production methods in our own factory permit us to keep the price well below that of comparable models. Write today for complete information.

Aloe

a. s. aloe company OF MINNESOTA
927 Portland Avenue, Minneapolis 4, Minn. • Phone:



Polyneuritis

Alcoholic Neuritis

Migraine

Herpes Zoster

Ostecarthritis

COBAMIN

COBAMIN
10 cc.
INJECTABLE
THE ULMER PHARMACAL COMPANY

The classic neurological symptoms of thiamine deficiency often resembles those of cyanocobalamin (Vitamin B12). Several of these well defined conditions have been treated satisfactorily with either or both of these factors. Adequate doses are necessary to influence prognosis favorably.

COBAMIN combines thiamine (100 mg.) and Vitamin B12 (500 mg.) per each cc. in a stable isotonic solution for intramuscular use. Stubborn neuropathies of the order listed and osteoarthritis frequently are controlled with COBAMIN therapy.

Literature available
on request.
SD-1155

The Ulmer Pharmacal Co.

1400 HARMON PLACE : MINNEAPOLIS, MINN.

officers include **Dr. E. J. Diefenbach**, vice president; **Dr. Marie Moorhead**, secretary, and **Dr. Annette Stenstrom**, treasurer.

* * *

Faculty members of the University of Minnesota Medical School and private practitioners conducted a free public health forum in St. Paul on January 25 and in Minneapolis on January 29, sponsored by the Minnesota Medical Foundation. Panel members answered questions which had been submitted by residents of both cities.

Chairman of the St. Paul forum was **Dr. A. E. Ritt**, president of the Ramsey County Medical Society. Acting as moderator for both meetings was **Dr. Cecil J. Watson**, chief of internal medicine at the University of Minnesota. Members of the panel for the St. Paul meeting were **Dr. Louis Tobian** and **Dr. Richard L. Varco**, faculty members of the University Medical School, and **Dr. John F. Briggs** and **Dr. Joseph F. Borg**, private practitioners.

At the Minneapolis forum **Dr. Robert E. Priest**, president of the Hennepin County Medical Society, served as chairman. The panel members, in addition to Dr. Tobian and Dr. Varco, with Dr. Watson as moderator, were **Dr Reuben A. Johnson** and **Dr. Harold Miller**, both in private practice.

* * *

Dr. C. W. Mayo was re-elected chairman of the Mayo Association at the annual meeting in Rochester on February 3. **Dr. Waltman Walters** and **Dr. Samuel F. Haine** were re-elected as vice chairmen.

* * *

Dr. Lowell L. Henderson, Rochester, was elected t fellowship in the American Academy of Allergy at th annual meeting of the organization in St. Louis, Missouri, on February 7.

* * *

Dr. George C. Hendrickson, member of the medica service staff of the Veterans Administration at For Snelling for ten years, has been appointed to the medica staff of the VA center at Fargo, North Dakota.

NEW LOCATIONS

Dr. E. E. Ulrich, formerly of Carey, Ohio, has becom associated in practice with **Dr. C. G. Wingquist** and **Dr R. D. Nichols** in Crosby.

* * *

Dr. Donald B. Swenson has opened offices for the practice of pediatrics at Mankato.

* * *

Dr. George L. Garske has moved his offices from 32 Doctors Building to 431 Marquette Bank Building, Minneapolis. His practice is limited to urology.

MINNESOTA BLUE CROSS-BLUE SHIELD

Since its origin in 1933 to December 31, 1955, Minnesota Blue Cross has provided 11,512,787.8 days hospital care for 1,897,661 participant subscribers.

Payments in the form of hospital benefits during th period totaled $122,898,837.

During the year 1955, hospital payments totalin $19,320,569.35 provided 1,033,781.2 days of hospit care for 167,667 Minnesotans.

The amount of benefits paid represented an increase of $1,573,463.17 over 1954; the number of days care increased 30,228.9 and the total number of hospital cases increased 1,678 over the same period.

Nearly 1,027,000 Minnesotans were covered by Blue Cross as of December 31, 1955, representing an increase in participation of 26,917 persons during the year.

In keeping with the policy of affording eligible Minnesotans the opportunity to provide themselves and their families the hospitalization protection they need, Blue Cross is announcing the availability of the Optional Series Contracts. These contracts are for non-group participants, that is, individuals do not have to belong to a group.

These are completely flexible contracts enabling eligible applicants to select the room and board coverage that best fits their needs and income.

From Minnesota Blue Shield's beginning in 1947 through December 31, 1955, over $25,282,130 has been paid to doctors for services rendered Minnesota Blue Shield subscribers. Of this impressive total $5,736,166 was paid by Blue Shield for doctors' services rendered subscribers during the year 1955 and $4,970,231 was paid for care of subscribers during 1954. The amount paid in 1955 is $765,935 more than was paid in 1954. This figure represents an increase of more than 15 per cent over the amount paid in 1954. During 1955 Blue Shield provided an average monthly payment of more than $478,013 for care of subscribers.

The Blue Shield statistical data for the year 1955 shows that 200,466 doctors' services were provided Blue Shield payments. In 1954 payment was provided for 169,445 doctors' services rendered subscribers. The number of services for which Blue Shield provided payment in 1955 is 31,021 greater than the number of services paid in 1954.

Blue Shield enrollment as of December 31, 1955, numbered 729,462 participant subscribers. The number of subscribers enrolled in Blue Shield as of December 31, 1955, was 58,705 greater than the number of subscribers enrolled as of December 31, 1954.

RADIUM RENTAL SERVICE
4340 CEDARWOOD ROAD
MINNEAPOLIS 5, MINNESOTA
TEL. FE 3-5297

Radium element prepared in type of applicator requested

ORDER BY TELEPHONE OR MAIL
PRICES ON REQUEST

you can save time and money with — P & H 4-ON STATEMENTS

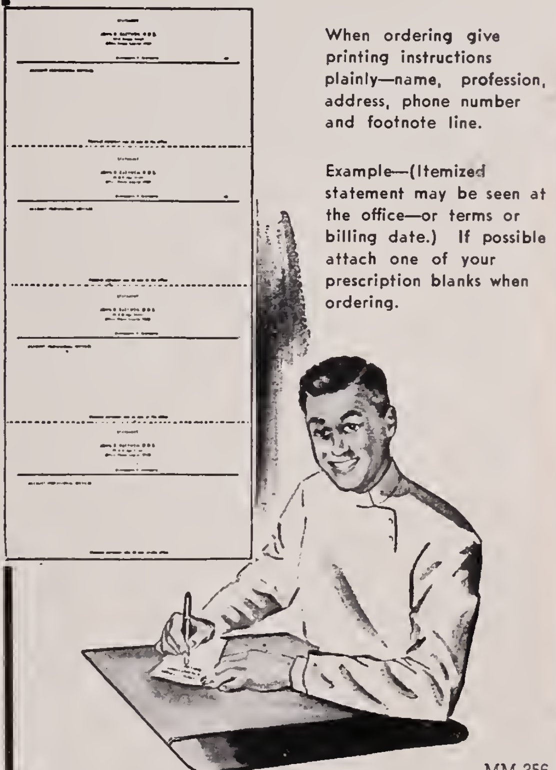
4 statements on one sheet! Put four statements in your typewriter at one time.

Perforation is clean cut for easy detachment. Several can be detached at one time.

Printed on heavy Hammermill Bond paper.

Designed to use with window envelopes so that the time used in addressing envelopes can be saved. Can be used with plain or No. 13—3c Government envelopes.

Compare our statement prices . . . you will be surprised at the saving.



When ordering give printing instructions plainly—name, profession, address, phone number and footnote line.

Example—(Itemized statement may be seen at the office—or terms or billing date.) If possible attach one of your prescription blanks when ordering.

MM-356

PHYSICIANS & HOSPITALS SUPPLY COMPANY
MINNEAPOLIS 3, MINNESOTA

Book Reviews

Books listed here become the property of the Ramsey, Hennepin and St. Louis County Medical Libraries when reviewed. Members, however, are urged to write reviews of any or every recent book which may be of interest to physicians.

VASCULAR SURGERY IN WORLD WAR II. Edited by Daniel C. Elkin, M.D., and Michael E. DeBakey, M.D. 464 pages. Illus. Price $4.25, buckram. Washington 25, D. C.: Superintendent of Documents, U. S. Printing Office, 1955.

THE EXCEPTIONAL CHILD FACES ADULTHOOD. Proceedings of the 1955 Spring Conference of the Child Research Clinic of the Woods Schools, held in New York City, May 6 and 7, 1955. 114 pages. Price $1.00 single copies; 75c each two to nine copies; 65c ten to forty-nine copies; 60c fifty to ninety-nine copies. Langhorne, Pa.: Woods Schools, 1955.

PREVENTIVE MEDICINE IN WORLD WAR II. Vol. III. Personal Health Measures and Immunization. Colonel John Boyd Coates, Jr., M.C., Editor-in-Chief; Ebbe Curtis Hoff, Ph.D., M.D., Editor for Preventive Medicine; Phebe M. Hoff, M.A., Assistant Editor. 394 pages. Illus. Price $3.25, buckram. Washington 25, D. C.: Superintendent of Documents, U. S. Printing Office, 1955.

HIPPOCRATES ON INTERCOURSE AND PREGNANCY. An English translation of "On Semen" and "On the Development of the Child." By Tage U. H. Ellinger, Sc.D., M.A. With an introduction by Alan F. Buttmacher. 128 pages. Price $2.50. New York: Henry Schuman, Inc., 1952.

The amazing fact learned from this work of Hippocrates is that in the fifth century before Christ there was much information known about reproduction, embryology and heredity. Intermixed with the brilliant observations are many strange and delightful ideas that make the reading interesting.

Human dissection was not practiced at the time this work was originally written. Thus the anatomy described is that of lower animals and describes a bicornuate, double uterus instead of one single chambered uterus present in the human.

D.W.K.

THE ONLY NEW MULTIFOCAL DESIGN IN 20 YEARS!

This new PC lens is completely identifiable for your protection*

The segment of the new PC lens has a distinctive shape — straight top with rounded corners — a protection against cheap imitations for you and your patients.

Besides being of highest quality, the PC lens includes these outstanding features:

- Straight top with rounded corners — Fused!
- The Barium crown segment assures freedom from color aberration to the fullest extent possible.
- The top line is slanted downward to make it least noticeable to the wearer, yet maintaining highest cosmetic qualities.
- Rounded corners make all of the segment useful.
- The optical center of the segment is only 4½ mm below the top line to minimize image jump.
- Slab-off prism can be ground coincident with the straight top line of the segment.
- The bifocal segment is available in two sizes — 21 mm wide by 15 mm high or 24 mm wide by 16¾ mm high.
- The trifocal segment is 24 mm wide, 6¾ mm intermediate with an overall height of 17½ mm.

First quality • Complete range of base curves

FOR COMPLETE INFORMATION CALL YOUR NEAREST BENSON LABORATORY OR WRITE:

*U. S. Patent No. 2,704,010

Since 1913 Benson OPTICAL COMPANY

Executive Offices • Minneapolis 2, Minn.

COMPLETE LABORATORIES CONVENIENTLY LOCATED IN UPPER MIDWEST CITIES

A MODERN
PRIVATE
SANITARIUM

for the
Diagnosis, Care
and Treatment
of Nervous
and Mental
Disorders

MAIN BUILDING—One of 10 Units in "Cottage Plan"

ST. CROIXDALE ON LAKE ST. CROIX

PRESCOTT, WISCONSIN

Located on beautiful Lake St. Croix, 18 miles from the Twin Cities, it has the advantages of both City and Country. Every facility for treatment provided, including recreational activities and occupational-therapy under trained personnel. Close personal supervision given patients, and modern methods of therapy employed. Inspection and cooperation by reputable physicians invited. Rates very reasonable. Illustrated folder on request.

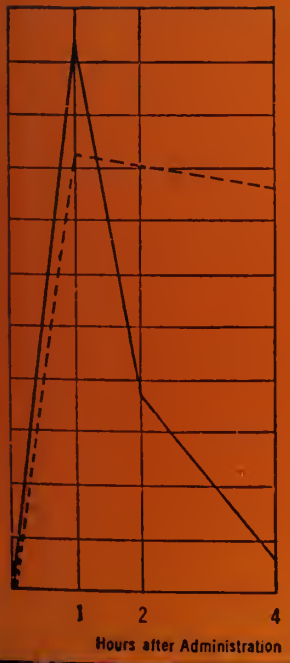
Prescott Office
Prescott, Wisconsin
Howard J. Laney, M.D.
Tel. 39 and Res., 76

Consulting Neuro-Psychiatrists
Hewitt B. Hannah, M.D., Andrew J. Leemhuis, M.D.
527 Medical Arts Bldg., Tel. FE. 2-1357, Minneapolis, Minn.

Superintendent
Ella M. Leseman
Prescott, Wisconsin
Tel. 69

---

w! Palatable Oral Suspension Gives
gher, Faster Blood Levels than Twice
Dose of Injected Procaine Penicillin



This ready-mixed, stable, and pleasantly flavored suspension is supplied as follows: PEN•VEE•*Suspension*, 300,000 units per 5-cc. teaspoonful, bottles of 2 fl. oz. Also available: PEN•VEE•*Oral* Tablets, 200,000 units, scored, bottles of 36; 500,000 units, scored, bottles of 12.

PEN•VEE*•*Suspensio*

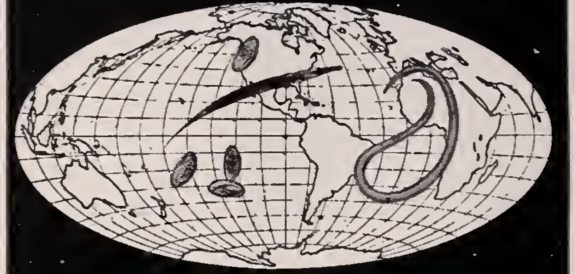
Benzathine Penicillin V Oral Suspension

ORAL PENICILLIN
WITH
INJECTION PERFORMANCE

Wyeth®
Philadelphia 1, Pa.

*Trad

'ANTEPAR'®*



for "This Wormy World"

PINWORMS

ROUNDWORMS

***SYRUP OF 'ANTEPAR'** Citrate brand Piperazine Citrate

Bottles of 4 fluid ounces, 1 pint and 1 gallon.

***TABLETS OF 'ANTEPAR'** Citrate brand Piperazine Citrate

250 mg. or 500 mg., Scored

Bottles of 100.

Pads of directions sheets for patients available on request.

BURROUGHS WELLCOME & CO. (U. S. A.) INC.
Tuckahoe, New York

THE
MEDICAL PROTECTIVE
COMPANY
FORT WAYNE, INDIANA

unique
in successfully fighting
malpractice charges

PROFESSIONAL PROTECTION
EXCLUSIVELY
SINCE 1899

MINNEAPOLIS Office:
Robert L. McFerran, Rep.,
311 East 24th St., Apt. A-1
Telephone Federal 9-1292
Donald D. Martin, Rep.,
318 E. 25th St., Apt. D-8
Telephone Federal 6-8751

Cook County Graduate School of Medicine

INTENSIVE POSTGRADUATE COURSES
STARTING DATES—SPRING, 1956

SURGERY—Surgical Technique, two weeks, April 2, April 16
Surgical Anatomy and Clinical Surgery, two weeks, June 18
Surgery of Colon and Rectum, one week, April 9, May 7
General Surgery, two weeks, April 23
Basic Principles in General Surgery, two weeks, April 9
Thoracic Surgery, one week, June 4
Esophageal Surgery, one week, June 11
Breast and Thyroid Surgery, one week, June 18
Gallbladder Surgery, ten hours, April 9, June 25
Fractures and Traumatic Surgery, two weeks, June 18
Varicose Veins, ten hours, April 30, June 18
GYNECOLOGY—Office and Operative Gynecology, two weeks, April 16, June 18
Vaginal Approach to Pelvic Surgery, one week, April 30, June 11
OBSTETRICS—General and Surgical Obstetrics, two weeks, May 7
MEDICINE—Internal Medicine, two weeks, May 7
Electrocardiography and Heart Disease, two-week basic course, March 12
Gastroenterology, two weeks, April 23
Dermatology, two weeks, May 7
RADIOLOGY—Diagnostic X-Ray, two weeks, April 30
Clinical Uses of Radioisotopes, two weeks, May 7
PEDIATRICS—Intensive Review Course, two weeks, May 14
Neurological Diseases: Cerebral Palsy, two weeks, June 18
UROLOGY—Two-week Course, April 16
Cystoscopy, ten days, by appointment

TEACHING FACULTY—ATTENDING
STAFF OF COOK COUNTY HOSPITAL

ADDRESS: REGISTRAR, 707 South Wood Street,
Chicago 12, Illinois

"Neohydrin...
offers the striking
advantage of
a high degree of
therapeutic
effectiveness upon
oral administration."*

*Krantz, J. C., Jr., and Carr, C. J.: The Pharmacologic Principles of Medical Practice, ed. 3, Baltimore, The Williams and Wilkins Company, 1954, p. 998.

98556

NEW!
**Patented HANSEN
Split Frame Truss**

Positive Hernia Control

Contoured Spring Design Gives
Custom Made Comfort
Unlimited Body Activity

**Single with Dummy illustrated
Double not Illustrated**

C. F. ANDERSON CO., INC.

901 Marquette
Minneapolis, Minnesota

Results With

'ANTEPAR'®*

against **PINWORMS**

In clinical trials, over 80% of cases have been cleared of the infection by one course of treatment with 'Antepar.'

Bumbalo, T. S., Gustina, F. J.,
and Oleksiak, R. E.:
J. Pediat. 44:386, 1954.

White, R. H. R., and
Standen, O. D.:
Brit. M. J. 2:755, 1953.

against **ROUNDWORMS**

"Ninety per cent of the children passed all of their ascarides . . ."

Brown, H. W.:
J. Pediat. 45:419, 1954.

***SYRUP OF 'ANTEPAR'** Citrate brand Piperazine Citrate

Bottles of 4 fluid ounces, 1 pint and 1 gallon.

***TABLETS OF 'ANTEPAR'** Citrate brand Piperazine Citrate

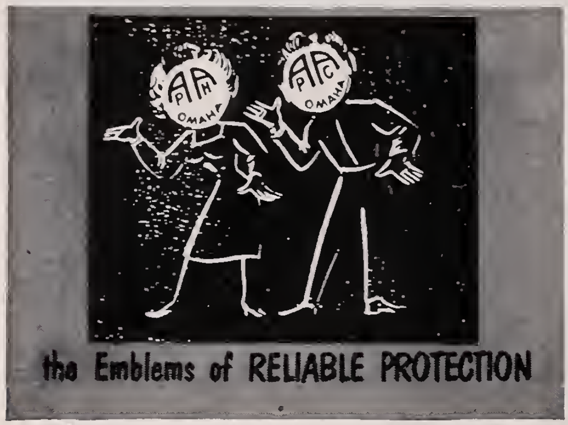
250 mg. or 500 mg., Scored

Bottles of 100.

Pads of directions sheets for patients available on request.

**BURROUGHS WELLCOME & CO. (U.S.A.) INC.
Tuckahoe, New York**

WE CORDIALLY INVITE YOUR INQUIRY for application for membership which affords protection against loss of income from accident and sickness (accidental death, too) as well as benefits for hospital expenses for you and all your eligible dependents.


APH
OMAHA
APC
OMAHA
the Emblems of RELIABLE PROTECTION

SINCE
1902

ALL PREMIUMS COME FROM

PHYSICIANS
SURGEONS
DENTISTS

ALL BENEFITS GO TO

$4,500,000 ASSETS
$22,500,000 PAID FOR BENEFITS

PHYSICIANS CASUALTY
AND
HEALTH ASSOCIATIONS
OMAHA 2, NEBRASKA

"The substitution of oral Neohydrin for parenteral meralluride was successfully accomplished in 97 per cent of 70 ambulatory clinic out-patients with chronic congestive heart failure."*

---

*Lawrence, W. E.; Kahn, S. S., and Riser, A. B.: South. M. J. 47:105, 1954.

58656

GYNECOLOGIC CYTOLOGY
SERVICE

Interpretation of Cervico-Vaginal, Etc.
(Papanicolaou) Smears
for the
Diagnosis of Carcinoma
Kits (Slides, Spatulas, Fixative and
Mailing Containers)
and
Instructions for Taking and Mailing
Smears furnished on request

M. WM. RUBENSTEIN, M.D.
GYNE-CYTOLOGY LABORATORY
104 S. MICHIGAN AVE. CHICAGO 3, ILL.

RADIUM

(Including Radium Applicators)
FOR ALL MEDICAL PURPOSES
Est. 1919
Quincy X-Ray and Radium
Laboratories
(Owned and Directed by a Physician-Radiologist)
HAROLD SWANBERG, B.S., M.D.
Director
W. C. U. Bldg. Quincy, Illinois

Brown & Day, Inc.

★

A Golden Anniversary Achievement!

HANOVIA'S
All-New Full Spectrum
ULTRAVIOLET
Quartz Health Lamp+Infrared

★

Gives all 12 bands of ultra-violet; tanning rays plus health-giving rays.

New design eliminates bulky transformer. Saf-T-Timer automatically signals end of exposure time.

ASK FOR DESCRIPTIVE FOLDER

"Everything for the Physician"

for fast service call CA 2-1845

BROWN & DAY INC. SAINT PAUL U.S.A.
SERVICE QUALITY

62-64 EAST 5TH ST
St. Paul 1, Minn.

GLYCAMINE®
TABLETS

For Peptic Ulcers and Hyperacidity

Available All Drug Stores

Distributed by
DALCO PHARMACAL CO.
Minneapolis, Minnesota

THE BANK
WHERE YOU
FEEL AT
HOME

the AMERICAN
NATIONAL BANK OF SAINT PAUL
MEMBER FEDERAL DEPOSIT INSURANCE CORPORATION

EVERY WOMAN

WHO SUFFERS

IN THE

MENOPAUSE

DESERVES

"PREMARIN"®

widely used

natural, oral

estrogen

AYERST LABORATORIES
New York, N. Y. • Montreal, Canada
5645

Classified Advertising

Replies to advertisements with key numbers should be mailed in care of MINNESOTA MEDICINE, *2642 University Avenue, Saint Paul 14, Minnesota.*

WANTED—Young General Practitioner, also young Internist to join small group consisting of Pediatrician, General Practitioner and General Surgeon in Minneapolis. Building is entirely new and designed for group practice. Address E-504, care MINNESOTA MEDICINE.

WANTED—Board-certified or board-eligible ophthalmologist. Group of thirteen doctors in small midwest community. Liberal starting salary and partnership after one year. Address E-510, care MINNESOTA MEDICINE.

WANTED—General practitioner for State Hospital. Salary range $641 to $781 per month. Quarters available, subsistence, laundry, and garage. Government working conditions, paid holidays, vacation, sick leave, and retirement pension plan. Write Superintendent, Fergus Falls State Hospital, Fergus Falls, Minnesota.

DOCTOR OR DENTIST—Beautiful suite in South Minneapolis. Very modern. Six months free rent. Then option of lease at very reasonable rent. Wm. L. Cochrane, 4101 - 42nd Avenue South, Minneapolis, Minnesota. Telephone Ro 9-8758.

WANTED—Assistant in General Practice in Central Minnesota. Prosperous community—good hunting and fishing. New 32-bed hospital. Address E-514, care MINNESOTA MEDICINE.

WANTED—Residents in Psychiatry. Opportunity for beginning and advanced candidates in five-year Minnesota State Program offered in collaboration with University of Minnesota and Mayo Foundation. Must be acceptable to above training centers. Stipends $5,000 to $7,000. Direct reply to Dale C. Cameron, M.D., Medical Director, Minnesota State Department Welfare, 117 University Avenue, Saint Paul 1, Minnesota, giving full information about training and experience.

WANTED—Superintendent-Manager, District Tuberculosis Sanatorium, Southwestern Minnesota. Agricultural town 8000. Modern residence. Requires training in tuberculosis control and preventive medicine, supervision District Tuberculosis control program. Salary open. Address E-517, care MINNESOTA MEDICINE.

WANTED—General practitioner to replace present doctor leaving to specialize. Unopposed practice with excellent immediate income. Address E-518, care MINNESOTA MEDICINE.

MODERN MEDICAL CLINIC, in Upper Peninsula of Michigan, is seeking services of Ophthalmologist or Ophthalmologist-Otolaryngologist or Doctor of Medicine capable of prescribing eyeglasses. Optician and modern eye shop associated in this clinic. Address E-520, care MINNESOTA MEDICINE.

POSITION WANTED—As assistant or associate in general practice. Minnesota graduate 1954, Duluth internship, now completing year of G.P. residency. Desires position in town over 2500 in lake region. Charles Pelzl, M.D., Sacramento County Hospital, Sacramento, California.

AVAILABLE August 1, young general practitioner for locum tenens or temporary association. Write E-519, care MINNESOTA MEDICINE.

ATTENTION DENTISTS AND DOCTORS—Modern space available for dentists' and doctors' offices. A location where several sets of doctors and dentists have been long established and then built their own clinics. A money maker. Above Kisch's Food Market. Plenty of auto parking space. Apply 637 Stryker Avenue, Saint Paul, Minnesota.

FOR RENT OR SALE—Eight-room, first-floor physician's office. Well equipped. Near Twin Cities. Gross over $30,000. New hospital—unlimited privileges. Good opportunity. Write E-511, care MINNESOTA MEDICINE.

FOR RENT—Highland Shopping Area, equipped office available, full or part time. Share with surgeon and dentist. Excellent for general practice, obstetrics, pediatrics. No equipment necessary; no rent until established. H. Schwyzer, M.D., 2069 Ford Parkway, Saint Paul. Telephone: MI 8-4832 or CA 4-7416.

FOR RENT—Office in new Medical and Dental Building in fastest-growing suburban Saint Paul district. All ground floor, plenty of parking space, near shopping center. Will remodel to suit. Address E-521, MINNESOTA MEDICINE.

FOR SALE—General Electric floor sun lamp, Mitchell Model 1909, like new. Write Mrs. Margaret Horn, 93 N. Lexington Avenue, Saint Paul 4, Minnesota. Telephone CApitol 7-4204.

FOR SALE—60 ma Westinghouse Shockproof X-ray. Tilting table and fluoroscopy tube and screen. $500 worth of accessories. Ideal machine for office use. First $1,000 takes it, cash or terms, f.o.b. Duluth. Address E-505, care MINNESOTA MEDICINE.

ARTIFICIAL LIMBS
ORTHOPEDIC APPLIANCES
TRUSSES
SUPPORTERS
ELASTIC HOSIERY

FREJKA
Abduction Pillow Splint by the Original Maker
For displasia of the hip in the newborn and in early postnatal life (as described by Dr. V. L. Hart, Journal of Bone and Joint Surgery, Vol. 31-A, pp 357-372, April, 1949).
Prompt, painstaking service

BUCHSTEIN-MEDCALF CO.
223 So. 6th Street
Minneapolis 2, Minn.

A more complete gall bladder regimen in a single tablet...

Colicell

Each Tite-Coat Red Tablet Contains:

Extracts of Whole Bile (Equal parts Ox and Hog) .... 210.0 mg.
Ketocholanic Acids (Oxidized or keto form of normally occurring bile acids containing approximately 93% dehydrocholic acid) .... 90.0 mg.
Methyl Cellulose .... 130.0 mg.
Homatropine Methylbromide .... 2.5 mg.
(In bottles of 100 and 1000 tablets.)

- *more effective . . . for a longer period of time*
- *specially coated to prevent gastric disturbance*
- *lower cost than most bile acid preparations that have only a single purpose*

SAMPLES AND LITERATURE ON REQUEST
SUTLIFF & CASE CO., INC.
Pharmaceutical Specialties
PEORIA, ILLINOIS

Index to Advertisers

Abbott Laboratories ... A-4, A-5
Aloe, A. S., Co. ... A-35
American Meat Institute ... A-20
American National Bank of Saint Paul ... A-43
Anderson, C. F., Co., Inc. ... A-41
Ayerst Laboratories ... A-43

Bayer Co., Division of Sterling Drug Co. ... A-10
Benson Optical Co. ... A-38
Birches Sanitarium, Inc. ... A-46
Brown & Day, Inc. ... A-43
Buchstein-Medcalf Co. ... A-44
Burroughs Wellcome & Co. ... A-40, A-41

Canfield, C. R., & Co. ... 148-D
Caswell-Ross Agency ... 148-A
Ciba ... A-28
Classified Advertising ... A-44
Cook County Graduate School of Medicine ... A-40
Crestview Hospital ... A-46

Dalco Pharmacal Co. ... A-43
Danielson Medical Arts Pharmacy, Inc. ... A-45
Druggists Mutual Insurance Co. ... A-45

Gyne-Cytology Laboratory ... A-42

Hazelden Foundation ... A-28
Hoffmann-La Roche (Gantrisin) ... Facing page A-16
Homewood Hospital ... A-46

Juran & Moody, Inc. ... A-24

Knox, Chas. B., Gelatine Co., Inc. ... A-11

Lakeside Laboratories (Neohydrin) ... A-23, A-41, A-42
Lederle Laboratories ... 148-B, 148-C
Lilly, Eli, & Co. ... Cover I, A-32

Mead Johnson & Co. ... A-13, Cover IV
Medical Protective Co. ... A-40

National Drug Co. ... A-26

Parke, Davis & Co. ... Cover II, A-1
Pfizer Laboratories ... A-21, A-29
Physicians Casualty & Health Associations ... A-42
Physicians & Hospitals Supply Co. ... A-37
Professional Credit Protective Bureau ... A-12

Quincy X-Ray and Radium Laboratories ... A-42

Radium Rental Service ... A-37

St. Croixdale Sanitarium ... A-39
Schering Corporation ... A-18, A-19, A-30, A-31
Searle, G. D., & Co. ... A-33
Sharp & Dohme ... A-9, A-17, A-25
Squibb ... A-22
Sutliff & Case Co., Inc. ... A-45

Tidy House Products Co. ... A-6

Ulmer Pharmacal Co. ... A-36
Upjohn ... A-27, A-35
U. S. Vitamin Corporation ... A-14, A-15

Viceroy Cigarettes ... A-8

Wallace Laboratories ... A-7
Winthrop Laboratories ... Cover III
Wyeth ... A-16, A-39

DANIELSON MEDICAL ARTS PHARMACY, INC.

10-14 Arcade, Medical Arts Building
825 Nicollet Avenue—Two Entrances—78 South Ninth Street
MINNEAPOLIS

PHONES:
FEderal 3-3317
FEderal 3-3318

HOURS:
WEEK DAYS—8 to 7
SUN. & HOL.—10 to 1

Insurance at a Saving

Druggists' Mutual Insurance Company
OF IOWA, ALGONA, IOWA
Fire - Tornado - Automobile Insurance

Prompt Loss Service

MINNESOTA REPRESENTATIVE—S. E. STRUBLE, WYOMING, MINN.

Entrance Foyer

Saint Paul's Exclusive

CRESTVIEW
NEUROPSYCHIATRIC
HOSPITAL

New . . Modern . . Complete . .

Providing the highest standard of service at the lowest cost.

- Occupational therapy and recreational department.
- Complete X-ray and laboratory.
- Electrocardiography—basal metabolism.
- Electroencephalography available.
- All patients rooms air-conditioned.
- Background music and psychotherapy sound equipment.
- Medically staffed by every neurologist and psychiatrist in Saint Paul.
- Especially trained nursing staff.

MEMBER of the American Hospital Association
MEMBER of the Minnesota Hospital Association
APPROVED by the Minnesota State Medical Association
and the Ramsey County Medical Society.

CRESTVIEW HOSPITAL • 145 W. College Ave., St. Paul
CApital 4-5841
A non-profit organization

HOMEWOOD HOSPITAL is one of the Northwest's outstanding hospitals for the treatment of Nervous Disorders equipped with all the essentials for rendering high-grade service to patient and physician.

Operated in Connection with
Glenwood Hills Hospitals

HOMEWOOD HOSPITAL
Corner Penn and Plymouth Avenues North
Minneapolis Minnesota

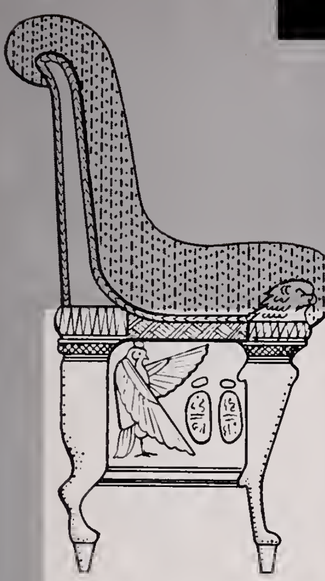
The Birches Sanitarium, Inc.

2391 Woodland Avenue
Duluth 3, Minnesota

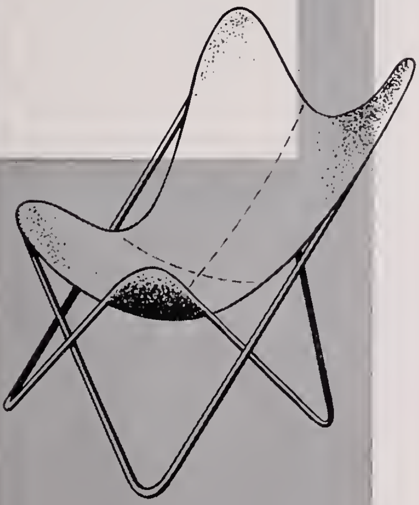
A hospital for the care and treatment of Nervous and Mental disorders. Quiet, cheerful environment. Specially trained personnel. Recreational and occupational therapy.

Dr. L. R. Gowan, M.D., M.S., Medical Director

FOR HYPERTENSION



"AN ALLIANCE
OF THE CLASSIC
AND CONTEMPORARY"



Synergistic Therapy with New THEOMINAL® R.S.

Now you can give your hypertension patients
the compound therapeutic advantages
of two successful hypotensive agents:
Theominal (theobromine with Luminal®)
and purified Rauwolfia serpentina alkaloids.

THEOMINAL R. S. *gives Better Control of Cardiovascular and Subjective Symptoms*

Theominal R. S. offers both the vasodilator and myocardial stimulant actions of theobromine with Luminal and the moderate central hypotensive effect of Rauwolfia serpentina. Gentle sedation calms the patient and a feeling of "relaxed well-being" is established. With Theominal R. S. the therapeutic potency of each of the components is enhanced and the chance of a patient's sensitivity to any one drug is lessened.

Each Theominal R. S. tablet contains:

Theobromine	0.32 Gm. (5 grains)
Luminal	10 mg. (⅙ grain)
Purified extract of Rauwolfia serpentina alkaloids	**1.5 mg.**

DOSE: **1 tablet two or three times daily.**

SUPPLIED: **bottles of 100 and 500 tablets.**

Winthrop
LABORATORIES
NEW YORK 18, N. Y.   WINDSOR, ONT.

THEOMINAL AND LUMINAL (BRAND OF PHENOBARBITAL), TRADEMARKS REG. U. S. PAT. OFF.

New...improved...

"instant"

Olac®

Powdered high protein formula

is easier to use

New, improved Olac dissolves instantly with water... makes a smooth, good-tasting formula with the briefest shaking or stirring.

...provides satisfying, growth-promoting feedings for

- full term bottle-fed babies
- prematures
- supplementary feedings of breast-fed babies

Olac's milk protein content is exceptionally generous. Its fat is a single highly refined vegetable oil. Curd tension is now reduced practically to zero.

Mead products and services are designed to help you in the varied phases of infant feeding

MEAD
SYMBOL OF SERVICE IN MEDICINE
MEAD JOHNSON & COMPANY, EVANSVILLE 21, INDIANA, U.S.A.

MSMA Annual Meeting—Rochester, May 21-23, 1956

Minnesota MEDICINE

COLLEGE OF PHYSICIANS
LIBRARY
APR 27 1956
OF PHILADELPHIA

PUBLISHED MONTHLY BY THE MINNESOTA STATE MEDICAL ASSOCIATION

Volume 39 APRIL, 1956 Number 4

Printed in U.S.A. (Table of Contents—Pages A-2 and A-3) 40c a copy—$3.00 a year

---

Fastest and shortest-acting oral barbiturate

'Seconal Sodium'
(SECOBARBITAL SODIUM, LILLY)

Among its many uses:
- Simple insomnia
- Unruly pediatric patients
- Obstetric patients
- Procedures associated with moderate pain

In 1/2, 3/4, and 1 1/2-grain pulvules and in ampoules, suppositories, and 'Enseals' (Timed Disintegrating Tablets, Lilly); also, Elixir 'Seconal' (Secobarbital, Lilly).

Lilly

no nicer way to . . . . . .

SUSPENSION
Chloromycetin®
PALMITATE

pleasant-tasting CHLOROMYCETIN for pediatric use

When a youngster's condition calls for CHLOROMYCETIN (chloramphenicol, Parke-Davis) you can make the treatment pleasant by prescribing SUSPENSION CHLOROMYCETIN PALMITATE. Because children like the taste of this custard-flavored suspension, missed doses and spilled doses are avoided. Each teaspoonful is willingly taken…and swallowed.

Precise adjustment of dosage, as directed, is made easier for the child's mother with SUSPENSION CHLOROMYCETIN PALMITATE. The fact that it needs no refrigeration is an added convenience.

CHLOROMYCETIN is a potent therapeutic agent and, because certain blood dyscrasias have been associated with its administration, it should not be used indiscriminately or for minor infections. Furthermore, as with certain other drugs, adequate blood studies should be made when the patient requires prolonged or intermittent therapy.

supplied:
SUSPENSION CHLOROMYCETIN PALMITATE,
containing the equivalent of 125 mg.
of CHLOROMYCETIN per 4 cc.,
is available in 60-cc. vials.

SUSPENSION
CHLOROMYCETIN
PALMITATE

MEDICAMENTA VERA
PD & CO.
PARKE, DAVIS & COMPANY DETROIT, MICHIGA

Minnesota

Contents fo

SCIENTIFIC ARTICLES

ORIGINAL CONTRIBUTIONS

Biliary Stricture
J. Bradley Aust, M.D., and *Richard L. Varco, M.D.*, Minneapolis, Minnesota 189

Pigmented Villonodular Synovitis
William G. Atmore, M.D., Duluth, Minnesota, *David C. Dahlin, M.D.*, and *Ralph K. Ghormley, M.D.*, Rochester, Minnesota 196

Present Concept of the Treatment of Arteriosclerosis Obliterans
J. Earle Estes, Jr., M.D., Rochester, Minnesota 203

Suction Drainage for the Prevention of Dead Space in Surgical Wounds
S. R. Maxeiner, Jr., M.D., and *Stanley R. Maxeiner, M.D.*, Minneapolis, Minnesota 206

SPECIAL ARTICLES

Minnesota Rheumatic Fever Survey, 1955
D. S. Fleming, M.D., M.P.H., Minneapolis, Minnesota, *F. J. Hirschboeck, M.D.*, Duluth, Minnesota, and *J. A. Cosgriff, M.D.*, Olivia, Minnesota 208

Home Accident Prevention
A. B. Rosenfield, M.D., M.P.H., Minneapolis, Minnesota 214

CASE PRESENTATIONS

Hematoma of the Rectus Abdominis Muscle
John Eiler, M.D., Park Rapids, Minnesota ....

Pheochromocytoma in a Seven-year-old Girl
Bernard J. Spencer, M.D., *O. S. Wyatt, M.D.*, and *Tague C. Chisholm, M.D.*, Minneapolis, Minnesota....

CONTINUATION STUDIES

Growth Hormone
B. J. Kennedy, M.D., Minneapolis, Minnesota ....

LABORATORY AIDS

Differential Diagnosis of Lymphocytosis and Leukemia
R. Dorothy Sundberg, Ph.D., M.D., Minneapolis, Minnesota ....

CURRENT CARDIAC CONCEPTS

The Present Status of the Treatment of Varicose Veins
Davitt A. Felder, M.D., Saint Paul, Minnesota..........

CLINICAL-PATHOLOGICAL CONFERENCE

Case Presentation
Wyman Jacobson, M.D., and *Ralph Smith, M.D.*, Minneapolis, Minnesota ....

Official Journal of

Duluth Surgical Society
Minneapolis Academy of Medicine
Minneapolis Obstetrical and Gynecological Society
Minneapolis Surgical Society
Minnesota Academy of Medicine
Minnesota Society of Clinical Pathologists

Owner and Publisher

Published by MINNESOTA STATE MEDICAL ASSOCIATION
496 Lowry Medical Arts Building
St. Paul 2, Minnesota

Editing and Publishing Committee

E. M. Hammes, M.D.
Chairman, Saint Paul

F. M. Owens, Jr., M.D.
Saint Paul

T. A. Peppard, M.D.
Minneapolis

Henry Ulrich, M.D.
Minneapolis

Business Manager

R. R. Rosell
496 Lowry Medical Arts Building
St. Paul 2, Minnesota

GENER

Authors

Manuscripts should be addressed to Arthur H. Wells, M.D., Editor, 915 East 1st Street, Duluth 5, Minnesota. Telephone RA 7-6636 or JA 5-2319. Original papers prep d for publication solely in Minnesota Medicine will be considered by the Board of Ed rs providing they fulfill the following editorial standards. Manuscripts should be ty d double spaced on white paper with at least 1-inch margins. The original (not a car n copy) is requested. The title on the first page should be under six words if pos e or divided into two parts. The author should give his highest degree, his instituti al position or his relationship to a hospital or medical organization which he may e addressing. Pages should be numbered consecutively and the author's last name sh d appear at the top of each page after the first page.

Biographical references should appear on a separate sheet entitled "Bibliography." T y should appear and be numbered consecutively in the order in which they first occu n the text (not alphabetically). Citations in the text require reference numbers if e author's or authors' names are not used or if there is more than one reference to e same author or group of authors. All references to author should appear in e Bibliography and no references should be included which are not in the text. The le and exact punctuation used in the J.A.M.A. references is requested. For a journal thi : *Author's last name, initial, initial.: title of paper. Abbreviated name of journal, vol e number: page, year.* Book references should give author, title, edition number, y, publisher and year.

Illustrations (photographs, tables and graphs) should be submitted separately and ot combined in the text. There should be a separate sheet entitled "Illustrations" w h contains the various types of illustrations listed separately and numbered in the o er

Medicine

Volume 39
Number 4

pril, 1956

MISCELLANEOUS ARTICLES

TORIALS

stening Ability and Success 236
roids and Arthritis 236
lesmanship 237
tivities of the Medical Testimony Committee 238
ue Cross and "Take-home Drugs" 239
ho Will Become an Alcoholic? 239
ctors—Not Time—Should Make the Diagnosis of Cancer 240
diation Protection for the Technician in Training 240
hat Constitutes the Practice of Medicine? 241

SIDENT'S LETTER

innesota and the American Medical Education Foundation 242

DICAL ECONOMICS

unty Society Officers Meeting 243
oup Life Insurance 244
tional Legislation 244
ars Foundation Continues Practice Grants 245

NNESOTA STATE BOARD OF DICAL EXAMINERS

inneapolis Man Sentenced for Violation of Basic Science Law 245
an Impersonating Physician Sentenced for Grand Larceny 245

THE DEAN'S PAGE

Laboratory Medicine 246

MINNESOTA STATE MEDICAL ASSOCIATION

103rd Annual Meeting—Preliminary Program 247

HISTORY OF MEDICINE IN MINNESOTA

The Medical History of Rice County (1855-1901) (Continued) *Adolph M. Hanson, M.D.*, Faribault, Minnesota 250

MEETINGS AND ANNOUNCEMENTS 257
WOMAN'S AUXILIARY 259
IN MEMORIAM 261
GENERAL INTEREST 263
BOOK REVIEWS A-38
CLASSIFIED ADVERTISING A-52, A-53
INDEX TO ADVERTISERS A-54

innesota Society of Internal Medicine
innesota State Medical Association
innesota Obstetric and Gynecologic Society
Minnesota Surgical Society
Northern Minnesota Medical Association
Southern Minnesota Medical Association

ORMATION

hich they appear in the text. All photographs must be in black and white, clear contrasting, and on glossy prints. Instructions for combining photographs are otable. Any number of illustrations over 4 are charged to the author. Combinations otographs up to one-half page (6 x 4⅜ inches) count as 1 illustration.

ders and Reviewers

e right is reserved to reject material submitted for reading or advertising columns. views expressed in this journal do not necessarily represent those of the Minnesota Medical Association or any of its constituents.

ertisers and Subscribers

ssified advertising—10 cents a word; minimum charge $2.00; key number, 25c ional. Remittance should accompany order. Display advertising rates on request.

nual Subscription—$3.00. Single Copies—$0.40. Foreign and Canadian—$3.50.

mmunications concerning advertising and subscriptions should be addressed to NESOTA MEDICINE, 2642 University Avenue, Saint Paul 14, Minnesota. Telephone Mid- 6-2641.

yright and Post Office Entry

ntents of MINNESOTA MEDICINE ©1956 by Minnesota State Medical Association.

tered at the Post Office in Saint Paul as second class matter. Accepted for mailing at special rate of postage provided for in Section 1103, Act of October 3, 1917, orized July 13, 1918.

Board of Editors

ARTHUR H. WELLS, M.D.
Editor-in-Chief, Duluth

STUART W. ARHELGER, M.D.
Minneapolis

JOHN F. BRIGGS, M.D.
Saint Paul

S. FRANCIS CEPLECHA, M.D.
Redwood Falls

TAGUE C. CHISHOLM, M.D.
Minneapolis

ROBERT B. HOWARD, M.D.
Minneapolis

R. DREW MILLER, M.D.
Rochester

HENRY G. MOEHRING, M.D.
Duluth

GLENN J. MOURITSEN, M.D.
Fergus Falls

OLIVE V. SEIBERT, B.A.
Saint Paul

GEORGE STILWELL, M.D.
Rochester

Aerial view of Rochester

Statue of Drs. William and Charles Mayo by the famous sculptor, James Earle Fraser.

Rochester Welcomes . . .

The Minnesota State Medical Association

for the

103rd Annual Meeting

May 21-23, 1956

Photos courtesy of Mayo Clinic an
Rochester Chamber of Commerce.

Convention City

Rochester, a city rich in history, was settled in the early 1850's by men who recognized its potential as an agricultural center. After the turn of the century, fate made it a world center of medicine. Today it is a bustling city of many pursuits.

Rochester, county seat of Olmsted County, is situated in the heart of southern Minnesota's rich agricultural and dairying section, approximately 75 air miles southeast of Minneapolis and St. Paul.

Rochester was founded in 1854 as a crossroads campground for wagon trains that were pouring into Minnesota. From a population of less than 50 in 1856, it has grown to become a city of 35,000 residents, with a transient population annually of 350,000.

Rochester is a fascinating combination of industry, commerce, fine homes and cultural institutions in the midst of an agricultural region.

Rochester's Health Center, housing the city's health department, gives Rochester residents, and particularly children, excellent care and health protection.

Rochester's beautiful and complete public library carries out the city's theme of service to its citizens, including audio-visual, club, and children's rooms.

Dates and Events

Sunday, May 20

Fellowship Hour, Officers, Councilors and Delegates, Kahler Hotel, 5:00 p.m.

Smorgasbord, Rochester Country Club, 6:00 p.m.

Monday, May 21

Luncheon, American Medical Women's Association, Town House, 12:00.

Dinner, Minnesota Academy of General Practice, Kahler Hotel, 6:15 p.m.

Dinner, Minnesota Society of Clinical Pathologists, Kahler Hotel, 6:30 p.m.

Open House, Minnesota State Medical Association, Mayo Civic Auditorium, 9:00 p.m.

Tuesday, May 22

President's Reception, Kahler Hotel, 6:00 p.m.

Dinner, Minnesota State Medical Association banquet, Kahler Hotel, 7:00 p.m.

Wednesday, May 23

Luncheon, Minnesota Medical Foundation, Town House, 12:15 p.m.

Luncheon, Minnesota Academy of Ophthalmology and Otolaryngology, Kahler Hotel, 12:15 p.m.

See page 247 for detailed program.

Rochester Committee

General chairman
Dr. W. E. Wellman

Banquet chairman
Dr. N. A. Christensen

Entertainment chairman
Dr. J. W. Henderson

Clinic and Scientific Exhibits chairman
Dr. O. H. Beahrs

Registration and Hotel Reservations chairman
Dr. C. F. Stroebel

Public Relations chairman
Dr. G. K. Stillwell

Art and Hobbies chairman
Dr. E. W. Johnson, Jr.

Golf chairman
Dr. J. H. Pratt

Skeet and Trap Shooting chairman
Dr. C. F. Lake

Transportation chairman
Dr. G. R. Biessner

Women's Auxiliary chairman
Mrs. W. A. Merritt

WATERS
ELECTRO-MEDICAL
INSTRUMENTS

OXIMETERS

For continuous, direct measurement of percent oxygen saturation of the blood.

Aseptic, Automatic
SURGICAL
CAMERAS

For close up, detailed color photography of open cavity surgery within the sterile zone.

As easily sterilized as the instruments . . . automatic operation.

Other quality analytical instruments for use in cardiovascular and pulmonary function laboratories.

THE WATERS CORPORATION
Electro-Medical Instrument Division
402 First Ave. N.W., Rochester, Minn.

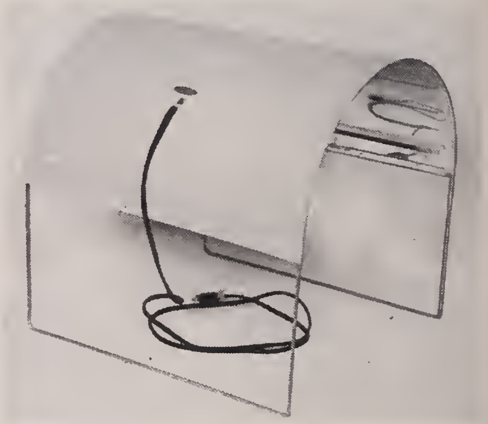
...Rochester Welcomes You!

Historical Museum—You are invited to visit the museum of the Olmsted County Historical Society, located downstairs in the public library building at the corner of Second street and Third avenue S.W. Come in and browse around. View the relics of pioneer Olmsted county.

Public Library—Transient visitors are invited to make use of the facilities of the Public Library, situated one block west of the Mayo Clinic building. The reading room provides newspapers, periodicals and transient service, while the Kellogg Room is a comfortable, quiet place for reading amid beautiful surroundings.

Art Center—For a pleasant way to spend your free time, visit the friendly Rochester Art Center at the corner of Third Avenue and West Center (about two blocks from the Clinic). Here you may enjoy an interesting exhibit of paintings, sculpture or crafts. You may visit the studio where classes in drawing, painting and pottery are being held, or the staff will help you in selecting attractive prints for your home from the print collection, at very modest prices.

Physical Therapy Bakers
For Hospital and Home Use



Low in cost
Convenient to use
Economical to operate
Manufactured and sold by
WOODHOUSE BROTHERS
428 South Broadway, Rochester, Minnesota
Phone 2-3891

Rochester's Famous
CAFE-GRILL

GREEN PARROT
Cafe
FAMOUS FOOD
1 BLOCK EAST OF CLINIC

Serving Fine Foods Moderate Prices

Steaks • Sea Foods
Breakfast Served Anytime
SERVING CONTINUOUSLY FROM 6 A.M. TO 10 P.M.

Open Sundays
8:30 A.M. to 7:45 P.M.

Pine Cheese Mart
TRULY A CHEESE WONDERLAND

Open 7 days a week
until 9 p.m.

★ Home of Old Smoky & Salami Cheese ★ Foremost Cheese House in America
★ Manufactured or Cured in our Cellars

MAIL ORDERS Phone 6-3011 *GIFT BOXES*

PINE ISLAND, MINNESOTA
16 MILES NORTH ON U. S. HIGHWAY 52

• •

122 First Avenue
Southwest

Rochester Store

Next to the
Green Parrot

GIFT PACKAGES — *BULK CHEESE* — *MAIL ORDERS*

Open 10 a.m. to 6:30 p.m. Phone 9201 CLOSED SUNDAYS

"Choose with Ease the Gifts that Please"

Rochester Is A City of Culture

MAYO CIVIC AUDITORIUM

Rochester is the home of the Mayo Civic Auditorium, erected in 1938 as a gift to the city from Dr. C. H. Mayo and the Mayo Association. Here the finest entertainment attractions, from stage and music to ice shows, are presented to the public. Rochester has its own Country Club, Tennis Club and University Club. It has a magnificent Public Library, and its own Art Center which not only contains the work of local artists but also exhibits the work of artists and craftsmen from various parts of the country. Visit Rochester's finest drug stores.

KAHLER HOTEL BUILDING

WEBER & JUDD CO.
PURE DRUGS

MASONIC TEMPLE BUILDING

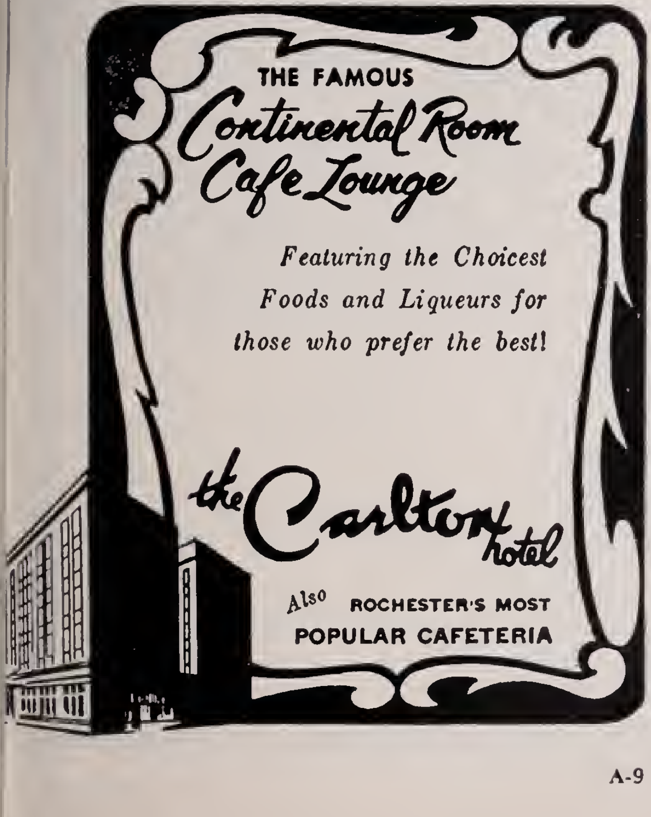
...Rochester Welcomes You!

The Mayo Clinic—The term "Mayo Clinic" usually refers to three buildings in downtown Rochester: the small "red brick" building built in 1914, the twenty-story tower-topped structure built in 1928, and the new ten-story clinic building completed in 1954.

The 1914 building is now used for clinical laboratory work. The 1928 building is largely devoted to therapy and to education through the Mayo Foundation. The new structure, called the New Clinic, is mainly used for diagnosis and patient-physician consultations. All three buildings are connected to each other.

The New Clinic building is 150 feet high and has about 49,000 square feet of working area on each of its ten floors. It is constructed so that up to eight more stories can be added to the present structure if needed. Designed in the form of a Greek cross, it has more than twice the space of the 1928 building.

A fourth Mayo Clinic building, Medical Sciences, is located one block south of the New Clinic. In it are laboratories for medical investigation and research. Special diagnostic procedures for patients are also carried out there.



THE FAMOUS
Continental Room
Cafe Lounge

Featuring the Choicest Foods and Liqueurs for those who prefer the best!

the Carlton hotel

Also ROCHESTER'S MOST POPULAR CAFETERIA

HOTEL
MARTIN

EUROPEAN

BATH OR PRIVATE TOILETS IN ROOMS

FIRST CLASS CAFE IN CONNECTION
Across the street from the Mayo Clinic

Rochester, Minn.

A. F. Gooding
Manager

Arthur Hotel Welcomes
the Members of the
Minnesota Medical Association
to Rochester

I BLOCK FROM CLINIC

FREE PARKING EXCELLENT CAFE

ARTHUR L. ROBERTS HOTELS
"Here & There" Throughout the Northwest
Indiana and Florida

Genuine Hospitality "All-Ways"
The Best in Rooms and Cuisine

Rochester's Finest Restaurant and Lounge

michaels

Intimate . . . gay . . . .

informal surroundings . . . Luncheons . . .

Dinners . . .

Cocktails . . .

Steaks Broiled to Perfection!

15 SOUTH BROADWAY
ROCHESTER, MINNESOTA .... OPEN 11 a.m. to 1 a.m.

"The House of Friendship"

Town House

BARestaurant

EXCELLENT
CUISINE

STEAKS
CHOPS
CHICKEN
SEA FOOD

3 BLOCKS EAST OF CLINIC
10 FIRST AVENUE SOUTHEAST

THE **Town House Apartment Hotel**

"A Pleasant Home away from Home"

THE KAHLER CORPORATION

welcomes

103rd Annual Convention

Minnesota State

Medical Association

HOTEL KAHLER

Elizabethan Room, The Kahler Hotel

Zumbro Cafeteria, Hotel Zumbro

We invite you to use these Kahler Corporation facilities during your stay—

In The Kahler Hotel
  The Kahler Coffee House
  The Elizabethan Dining Room
  The Hemisphere Room Cocktail Lounge

In The Hotel Zumbro
  The Zumbro Cafeteria
  The Java Ho Fountain

The Model Laundry   The Kahler Auto Parks

HOTEL ZUMBRO

THE KAHLER HOTEL

HOTEL ZUMBRO

Rochester, Minnesota

YOU MADE THEM FAMOUS

Rochester Dairy

MILK – ICE CREAM
and
DAIRY PRODUCTS

Hollands
of Rochester
CAFETERIA BAKERY
A CHEERFUL, POPULAR PRICED CAFETERIA
WIDELY RECOMMENDED

All foods prepared before your eyes in our open kitchen —insuring perfect cleanliness.
GENEROUS SERVINGS OF "OVEN FRESH" ROASTS AND CAREFULLY PREPARED VEGETABLES, PLUS OUR OWN PASTRIES, GUARANTEES YOUR SATISFACTION.
Block South of Clinic

Call A - - -
YELLOW CAB
For Dependable Courteous Service!
Phone 4071
HERTZ RENT-A-CAR
Licensee

...Rochester Welcomes You!

Clinic Carillon—The Rochester Carillon, located in the tower of the Mayo Clinic building, is a gift of Drs. William and Charles Mayo. The carillon consists of twenty-three bells having a total weight of 36,988 pounds. The largest bell weighs 7,840 pounds and the smallest 168 pounds.

The bells are proportioned scientifically to produce a flowing evenness of effect throughout the whole compass of the carillon. They are made of the purest bell metal, cast in the foundry of Gillett & Johnston of Croydon, England. Before shipment to Rochester, the bells were played by the foremost Belgian carillonneur and were consecrated by the Archbishop of Canterbury.

The carillon is tuned to the notes of the chromatic scale, upon which music in two or more parts may be played. The bells are hung stationary and are played automatically or by the carillonneur, James J. Drummond. Half-hour recitals are given on Sundays, Wednesdays and Fridays.

Rochester's Lobb Field is one of the finest. Serving three major airlines as well as a heavy flow of private planes, it receives visitors from all over the world.

Delicious Hand-Made Candies
Lucille's
Chocolate Shop
One-Half Block East of the Clinic on
First Street S. W.
● SALTED NUTS
● IMPORTS
"Fresh Daily"

Welcome

to

Rochester

Downtown
Rochester

RETAIL MERCHANTS ASSOCIATION

for your complete insurance needs . . .

- ☆ PROFESSIONAL
- ☆ PERSONAL
- ☆ PROPERTY

• ST. PAUL FIRE AND MARINE • CO.
MERCURY INSURANCE CO • ST. PAUL MERCURY INDEMNITY CO.
The Saint Paul Companies
SINCE 1853
INSURANCE
LAND • SEA • AIR

CHOICE OF THE MINNESOTA MEDICAL ASSOCIATION FOR PROFESSIONAL LIABILITY INSURANCE

THERE IS A SAINT PAUL AGENT IN YOUR COMMUNITY
AS CLOSE AS YOUR PHONE

HOME OFFICE: 111 WEST FIFTH STREET, SAINT PAUL 2, MINNESOTA

INSTRUMENTATION IN CLINICAL AND RESEARCH MEDICINE

Welcome to

MEDTRONIC

Booth 47

- OSMOMETER
- FLAME PHOTOMETER
- TRITIUM ASSAY APPARATUS
- SCINTILLATION & COUNTING EQUIPMENT
- MONITORING OSCILLOSCOPE

- VISO-CARDIETTE
- METABULATOR
- TWIN BEAM
- MULTI-CHANNEL RECORDING EQUIPMENT
- VECTOR SYSTEM

Sterling 1-4225
818 NINETEENTH AVENUE N.E.
Minneapolis 18, Minnesota

For complete gall bladder regimen...

Colicell

A single COLICELL tablet is more effective for a longer period and is carefully coated to prevent gastric disturbance. In bottles of 100 and 1000 tablets.

SAMPLES AND LITERATURE ON REQUEST

SINCE 1843

SUTLIFF & CASE COMPANY, INC.
Pharmaceutical Specialties • PEORIA, ILLINOIS

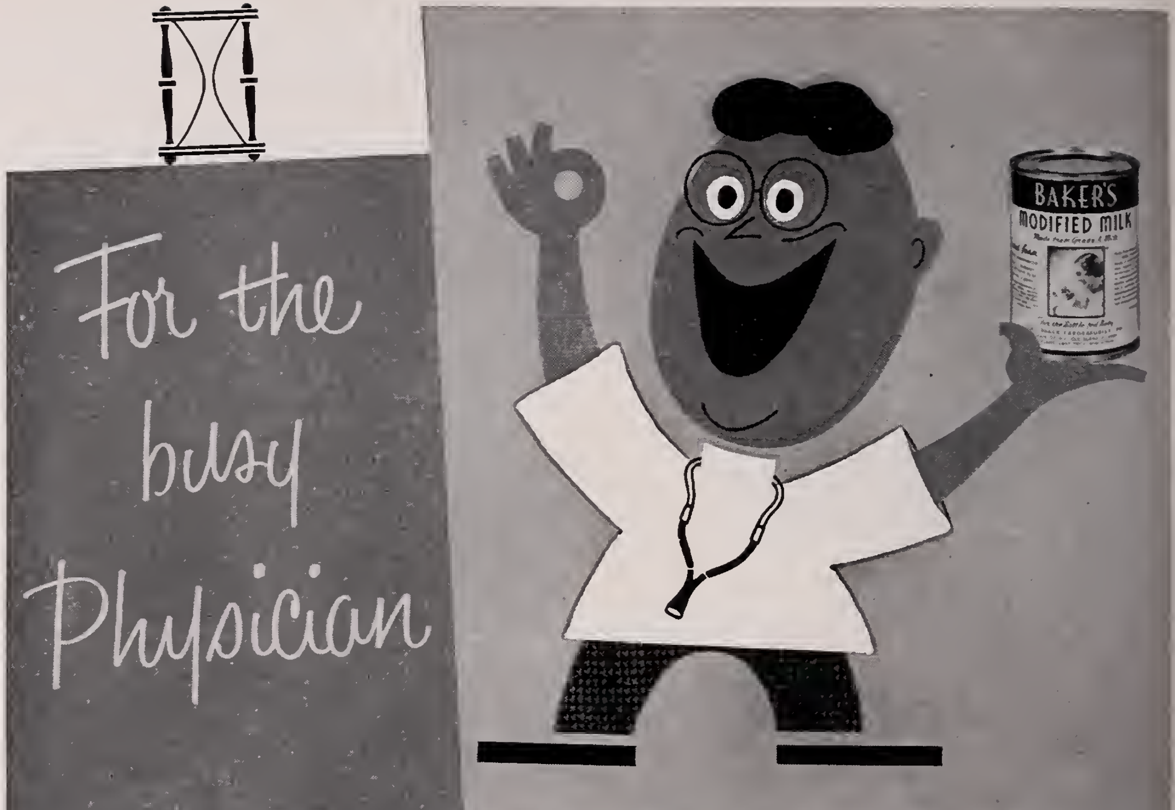
Each Tite-Coat Red Tablet Contains:

Extracts of Whole Bile (Equal parts Ox and Hog)	210.0 mg.
Ketocholanic Acids (Oxidized or keto form of normally occurring bile acids containing approximately 93% dehydrocholic acid)	90.0 mg.
Methyl Cellulose	130.0 mg.
Homatropine Methylbromide	2.5 mg.

close-up on **Medicine**

The Minnesota State Medical Association again will present close-up views of "live" operative and clinical demonstrations via color television, May 21-23, for physicians attending the Association's 103rd Annual Meeting in Rochester. Through the versatile eye of the camera, viewers will see clinical material ordinarily impossible to present before a mass audience. More than 1,000 physicians at each colorcast will be shown items varying in size from a minute lesion to an iron lung on two 4½ by 6 foot color screens located in the Mayo Civic Auditorium.

Smith, Kline & French
Laboratories, Philadelphia



SEEKING A TIME-SAVING INFANT FOOD

BAKER'S MODIFIED MILK*

Designed for all infant feeding from birth to the end of the first year, Baker's Modified Milk is a time-saver for busy physicians and busy hospitals. Simply dilute Baker's to prescribed strength with water.

Baker's Modified Milk is furnished gratis to all hospitals for your use.

FEEDING DIRECTIONS

(Normal dilution for liquid provides 20 calories per liquid ounce.)

	Baker's	Boiled Water
Hospital	1 part	2 parts
First week at home	1 part	1½ parts
After first week at home	1 part	1 part

Also available in powder form. (Normal dilution one tablespoon to 2 ounces of water provides 20 calories per fluid ounce.

*Made from Grade A Milk (U. S. Public Health Service Milk Code)

THE BAKER LABORATORIES, INC.
Milk Products Exclusively for the Medical Profession
Main Office: Cleveland 3, Ohio • *Plant:* East Troy, Wisconsin

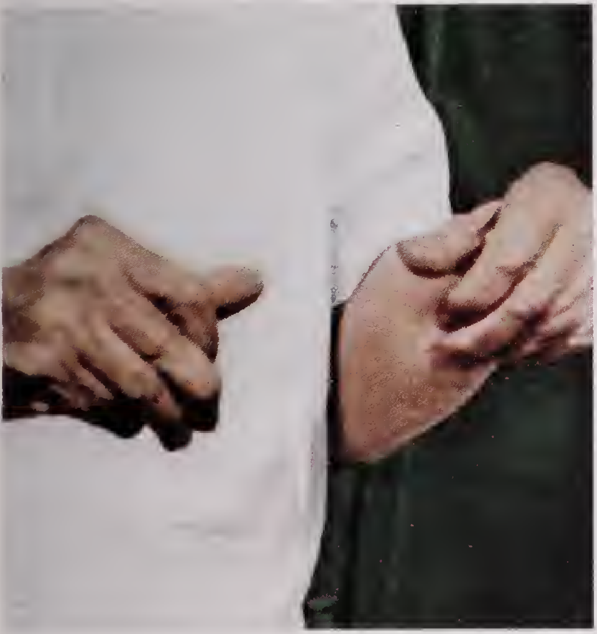
in rheumatoid arthritis

METICORTEN

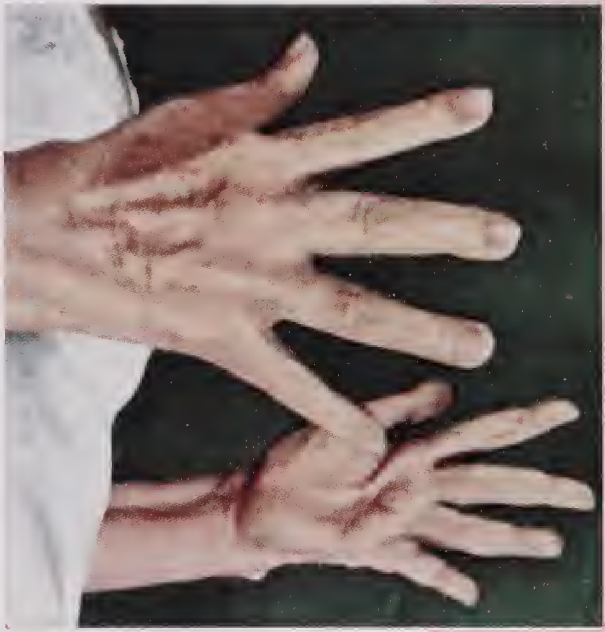
(PREDNISONE)

Schering

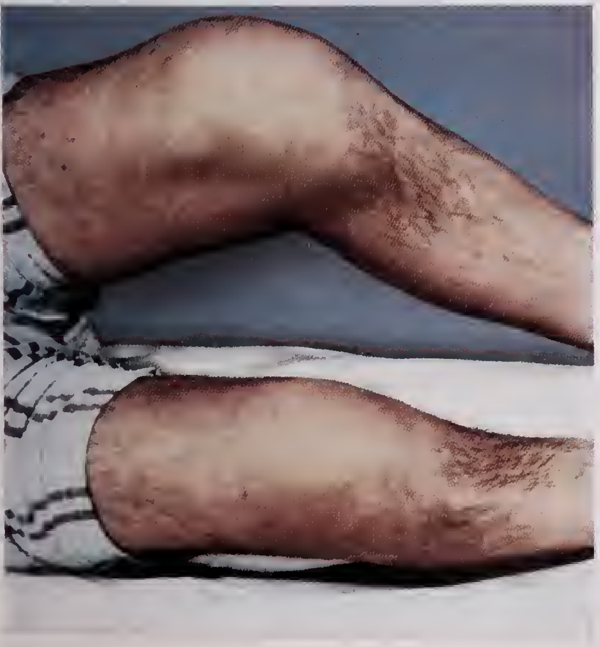
results—*excellent* · edema—*rare*



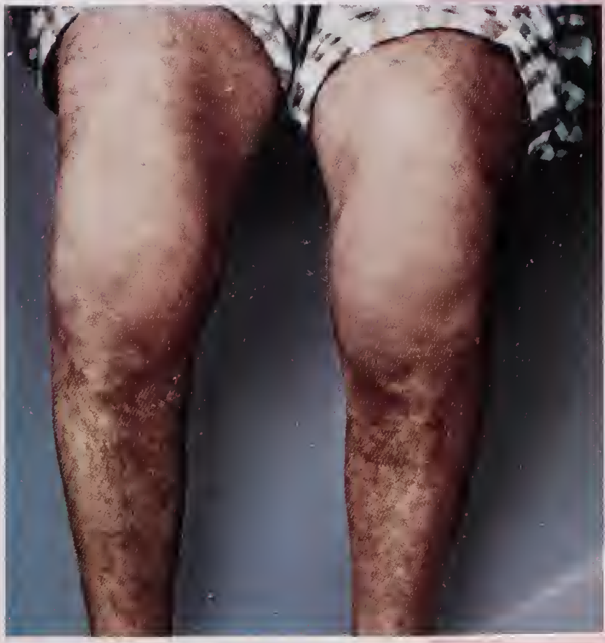
Deformed hands of woman with rheumatoid arthritis before therapy. Unable to open hands.



After two weeks on METICORTEN, *patient is free of pain and can open hands completely.*



Acutely swollen, painful knees in man with rheumatoid arthritis before therapy.

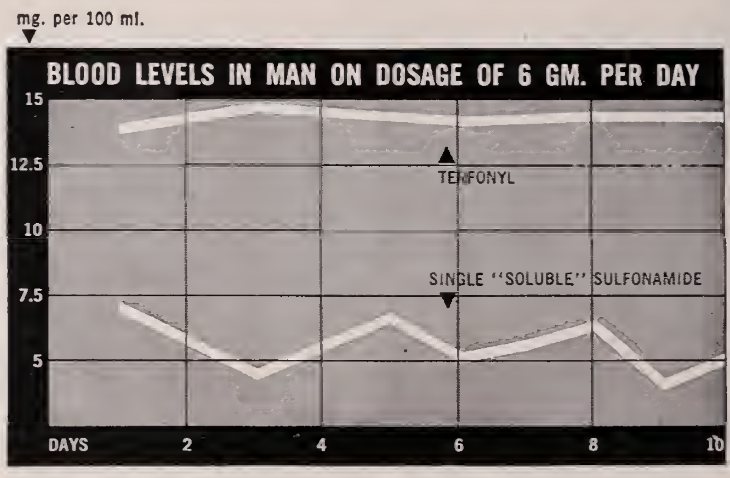


After two weeks on METICORTEN, *swelling of knees is gone and patient can walk without difficulty.*

maximum efficacy with minimum risk

Terfonyl

SQUIBB METH-DIA-MER SULFONAMIDES



— After Lehr, D., Modern Med. 23:111 (Jan. 15) 1955.

Terfonyl is absorbed as well as single "soluble" sulfonamides, but is eliminated at a slower rate. For this reason, Terfonyl blood levels are much higher.

In experimental infections (Klebsiella, Pneumococcus, Streptococcus), Meth-Dia-Mer sulfonamides have been shown to be from three to four times more effective on a weight basis than single "soluble" sulfonamides.

Toxicity is minimal because normal dosage provides only one-third the normal amount of each sulfonamide. The body handles each component as though it were present alone, although therapeutic effects are additive.

Terfonyl Tablets, 0.5 Gm., bottles of 100 and 1000.
Terfonyl Suspension, 0.5 Gm. per 5 ml., pint bottles.

0.167 Gm. each of sulfamethazine, sulfadiazine and sulfamerazine per tablet or per 5 ml. teaspoonful of suspension.

SQUIBB

'TERFONYL'® IS A SQUIBB TRADEMARK

New Evidence on Rauwiloid®

confirms and defines superiority over other Rauwolfia preparations in the treatment of HYPERTENSION

- Rauwiloid represents the balanced, mutually potentiated actions[1] of several Rauwolfia alkaloids, of which reserpine and the equally antihypertensive rescinnamine have been isolated.
- Hence, reserpine is not the total active antihypertensive principle of the rauwolfia plant.
- Rauwiloid is freed of the undesirable alkaloids of the whole rauwolfia root. Recent investigations confirm the desirability of Rauwiloid (because of the balanced action of its contained alkaloids) over single alkaloidal preparations; "...mental depression...was...less frequent with alseroxylon..."[2]

The dose-response curve of Rauwiloid is flat, and its dosage is uncomplicated and easy to prescribe...merely two 2 mg. tablets at bedtime.

---

[1] Cronheim, G., and Toekes, I. M.; Comparison of Sedative Properties of Single Alkaloids of Rauwolfia and Their Mixtures, Meet. Am. Soc. Pharmacol. & Exper. Therap., Iowa City, Iowa, Sept. 5, 1955.

[2] Moyer, J. H.; Dennis, E., and Ford, R.: Drug Therapy (Rauwolfia) of Hypertension. II. A Comparative Study of Different Extracts of Rauwolfia When Each Is Used Alone (Orally) for Therapy of Ambulatory Patients with Hypertension, A.M.A. Arch. Int. Med. *96*:530 (Oct.) 1955.

Riker
LOS ANGELES

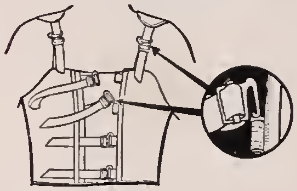
Rauwiloid is the original alseroxylon fraction of India-grown Rauwolfia serpentina, Benth., a Riker research development.

Something NEW in Surgical Binders...

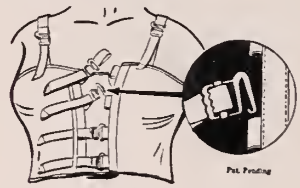
the muller BINDER

ELIMINATES adhesive tape

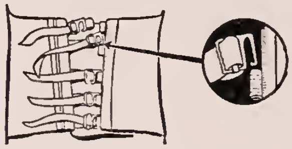
- ★ ORTHOPEDICS
- ★ OBSTETRICS
- ★ COLOSTOMY
- ★ MASTECTOMY
- ★ THOROCOPLASTY
- ★ GENERAL SURGERY



MALE CHEST BINDER, made in standard two inch sizes, 36-44.



FEMALE CHEST BINDER, made in standard two inch body sizes, 32-44.



ABDOMINAL BINDERS for both male and female are made in standard 12 inch width, waist sizes 24-44. Four size ranges, with a five inch adjustment in each. *Small* (24-29), *Medium* (29-34), *Large* (34-39), *Extra Large* (39-44). Female Binders provide for vaginal pad attachments and are complete with hose supporters.

THE PATENTED SELF-LOCKING BUCKLE eliminates pins and adhesive tape after surgery in this adjustable, removable, washable twilled binder.

Made in a range of sizes for male and female use, the Muller Binder is available in both abdominal and chest types. The fabric is arranged and stitched to prevent wrinkling and forms a wide, snug, easy fitting girdle. It is loosened or tightened by web strips—each strip closed with its own self-locking buckle.

ASK FOR the Muller bulletin—or a free sample—so that you can see how it eliminates adhesive tape . . . doesn't disturb the sterile gauze pad . . . saves nurses' time . . . can be worn home from the hospital . . . and is washable and re-usable.

Available from your surgical supply dealer.

THE TEXAL COMPANY

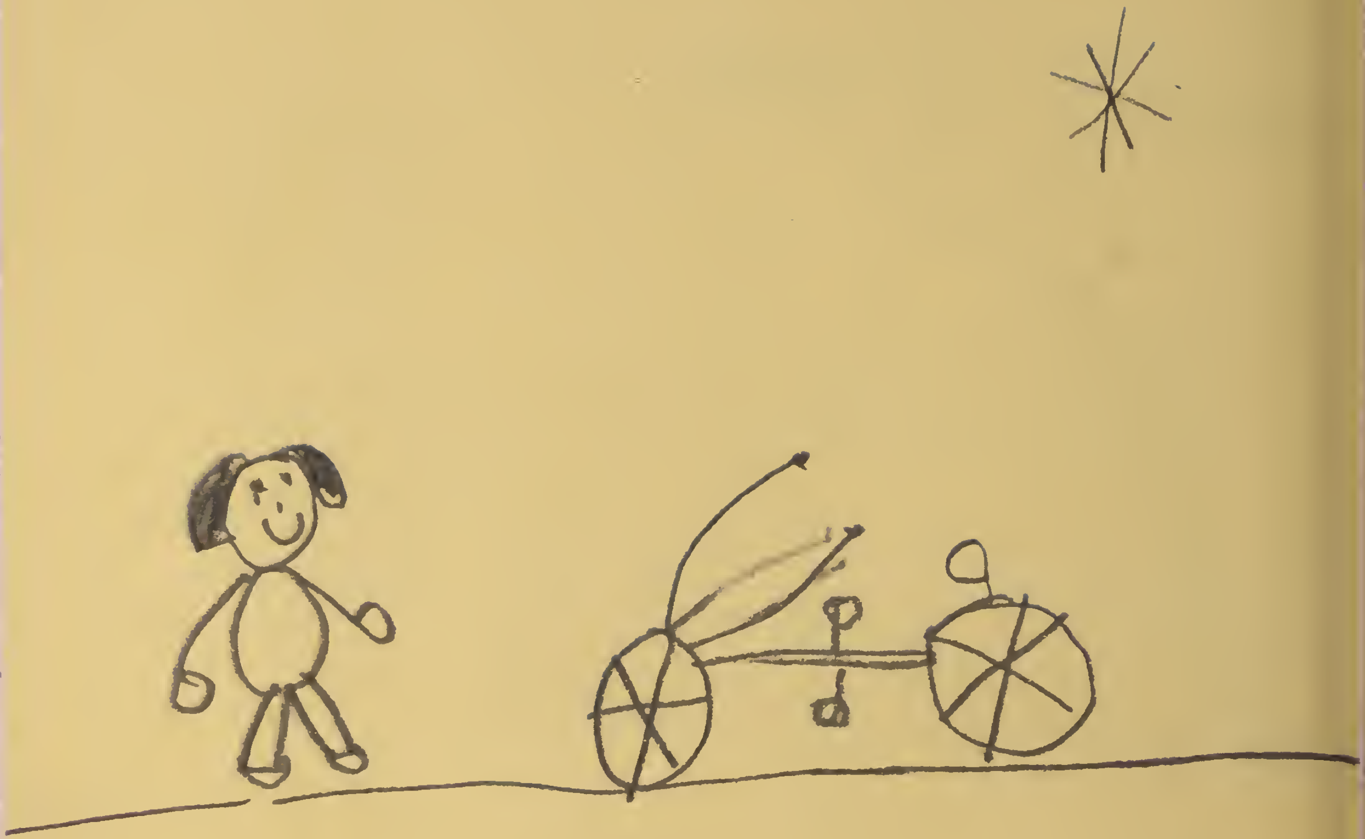
510c FIRST AVENUE NORTH
MINNEAPOLIS 3, MINNESOTA

Rib Splints • Arm Slings • Clavicle Straps

Gantrisin, a single, soluble, wide-spectrum sulfonamide, is remarkably effective and well tolerated, too... good reasons why more and more physicians are using Gantrisin at the first sign of systemic infection.

Hoffmann - La Roche Inc
Nutley · N.J.

Gantrisin® - brand of sulfisoxazole



For the bug and the bugaboo

Gantrisin (acetyl) Pediatric Suspension
is often the answer to both the infectious organism
and the bugaboo of medicine taste.

Gantrisin is a single, soluble, wide-spectrum
sulfonamide, well tolerated by all ages. The acetyl
form has a fine raspberry flavor -- no medicine taste.

Gantrisin® - brand of sulfisoxazole

Gantrisin® (acetyl) - brand of acetyl sulfisoxazole

ROCHE

original research in medicine and chemistry

All the benefits of prednisone and prednisolone plus positive antacid action to minimize gastric distress

Multiple Compressed Tablets of 'Co-Deltra' and 'Co-Hydeltra' are designed to help the physician cope with the problem of gastric distress which might otherwise become an obstacle to therapy with the newer steroids prednisone and prednisolone. Each Multiple Compressed Tablet is specifically formulated as a "tablet within a tablet" to provide stability and to release in sequence antacid and anti-inflammatory components.

NEW

'Co-Hydeltra' **Prednisolone Buffered**

and

'Co-Deltra' **Prednisone Buffered**

MULTIPLE
COMPRESSED
TABLETS

Supplied: Multiple Compressed Tablets of 'Co-Deltra' and 'Co-Hydeltra', each containing 5 mg. prednisone or prednisolone, 300 mg. of dried aluminum hydroxide gel, U.S.P., and 50 mg. of magnesium trisilicate, U.S.P., bottles of 30 tablets.

'Co-Deltra' and 'Co-Hydeltra' are the trademarks of Merck & Co., Inc.

SHARP DOHME
Philadelphia 1, Pa.
DIVISION OF MERCK & CO., INC.

24-hour control

for the majority of diabetics

10 cc.
'WELLCOME'
GLOBIN INSU
WITH ZINC
'B.W. & CO'
40 UNITS IN 1 CC
KEEP IN A COLD PLACE
Burroughs Wellcome
MADE IN U.S.A.

GLOBIN INSULIN

'B.W. & CO.'®

a clear solution . . . easy to measure accurately

Discovered by Reiner, Searle, and Lang
in The Wellcome Research Laboratories

BURROUGHS WELLCOME & CO. (U.S.A.) INC. • Tuckahoe 7, New York

ideal endocrine "companion"
for menopausal patients
Schering
ESTINYL
TABLETS
0.02 mg.
or
0.05 mg.

comforts—Controls major symptoms within 6 to 10 days, hot flushes in as few as 3 days.

cheers—Confers a welcome feeling of physical vitality and mental well-being.

compatible—Much less prone to cause the side effects so often experienced with stilbene derivatives.

thrifty—Does "a better job at far less cost" and is "much better to use than any of the so-called naturally conjugated estrogens."*

---

*Clinton, M., Round Table Discussion: New York J. Med. 54:481, 1954.
ESTINYL,® brand of Ethinyl Estradiol U.S.P.

EE-J 61 35o

KARO® SYRUP . . . meets the need for an easily digested milk modifier

Since the newborn infant has very little ability to digest starchy foods, the carbohydrate requirements of the formula-fed baby are best met with a milk modifier which places a minimum demand on the digestive system.

Karo syrup has been a carbohydrate milk modifier of choice for three generations. Because it is a balanced mixture of dextrins, maltose and dextrose, it enables the feeding of larger amounts of total carbohydrate without producing gastro-intestinal disturbances.

Other characteristics that commend the use of Karo for milk modification are—the ease with which formulas may be calculated or prepared—its ready availability—and its economy. Light or dark Karo syrup may be used interchangeably with cow's milk or evaporated milk and water. Each fluid ounce (2 tablespoonfuls) yields 120 calories of solid nutrition.

1906 · 50th ANNIVERSARY · 1956
CORN PRODUCTS REFINING COMPANY
MEDICAL DIVISION
17 Battery Place, New York 4, N. Y.

Karo
SYRUP
CRYSTAL WHITE

when the
patient
really needs a
diuretic—

HE NEEDS AN ORGANOMERCURIAL

In those patients with borderline or very mild congestive heart failure who can even get along without diuretic therapy, any agent producing minimal or intermittent diuresis may appear to produce benefit.

But when cardiac decompensation—mild, moderate, or severe—is established, dependable and continuously effective diuresis—obtainable only with potent oral organomercurials—is a therapeutic necessity.

TABLET
NEOHYDRIN®
BRAND OF CHLORMERODRIN (18.3 MG. OF 3-CHLOROMERCURI-2-METHOXY-PROPYLUREA EQUIVALENT TO 10 MG. OF NON-IONIC MERCURY IN EACH TABLET)

LAKESIDE

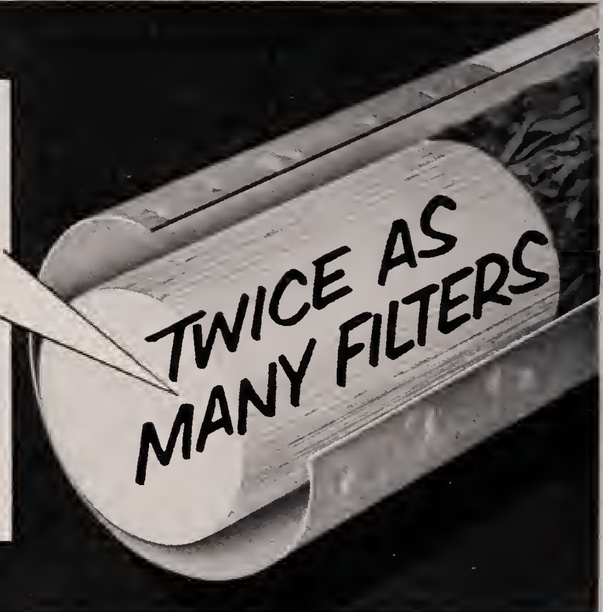
a standard for initial control of severe failure

MERCUHYDRIN® SODIUM
BRAND OF MERALLURIDE INJECTION

99456

What makes Viceroy different from other filter cigarettes?

Only VICEROY— has 20,000 tiny filters in every tip . . . twice as many as the other two largest-selling filter brands! That's why you get that fresh, clean real tobacco taste!



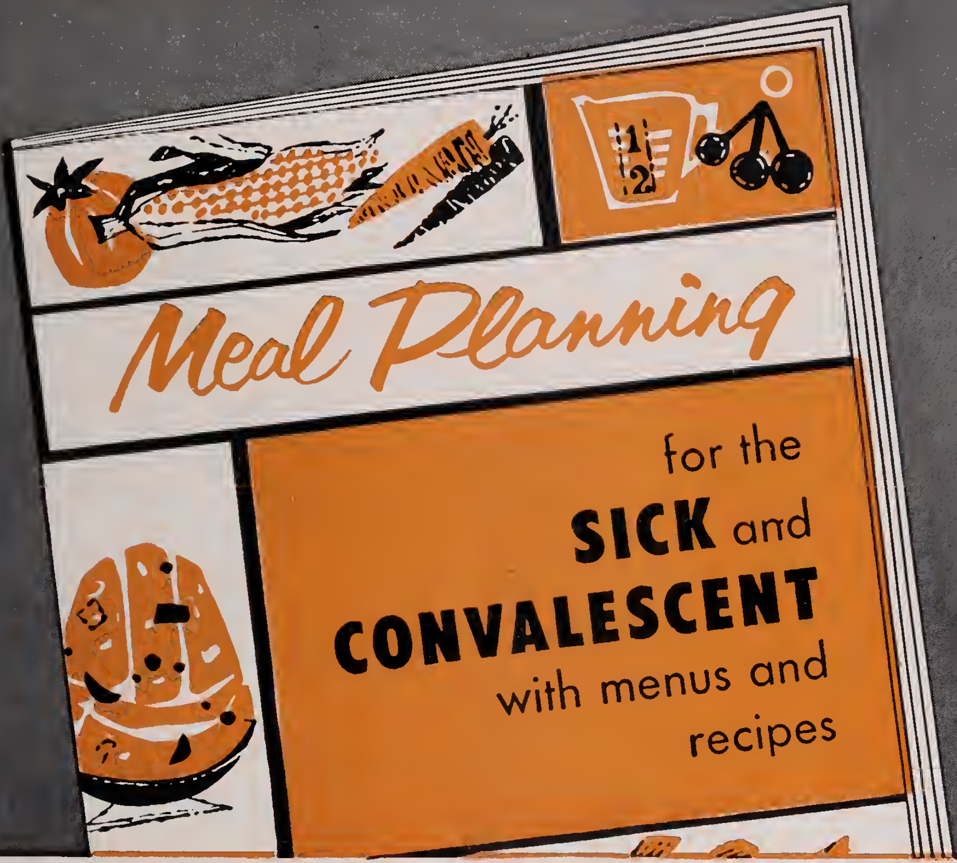
The VICEROY filter tip contains 20,000 tiny filters made exclusively from pure cellulose . . . soft, snow-white, natural. This is twice as many filters as the other two largest-selling filter brands. That is why VICEROY gives you such a fresh, clean taste—that real tobacco taste you miss in other filter brands. No wonder so many doctors now smoke and recommend King-Size VICEROYS.

If it's Viceroy you can tell the difference blindfolded!

VICEROY
Filter Tip
CIGARETTES
KING-SIZE

King-Size Filter Tip **VICEROY**

KNOX Protein Previews



New Booklet Presents
Latest Facts on Feeding the Sick

KNOX
UNFLAVORED
GELATINE

Adequate nutrition during illness and convalescence is essential for recovery whether the patient is managed in the hospital or at home. In the latter case, physicians often must devote much time to instructing those responsible for caring for the sick in good nutritional practices.

"Meal Planning for the Sick and Convalescent" has been designed to relieve you of the need for repeating over and over again essential dietary facts. This new Knox booklet presents in layman's language the latest nutritional applications of proteins, vitamins and minerals, gives practical hints on serving food to adults and children, suggests ways to stimulate appetite and describes diets from clear liquid to full convalescent. Best of all it offers the homemaker for the first time detailed daily suggested menus for each type of diet, plus 14 pages of tested nourishing recipes.

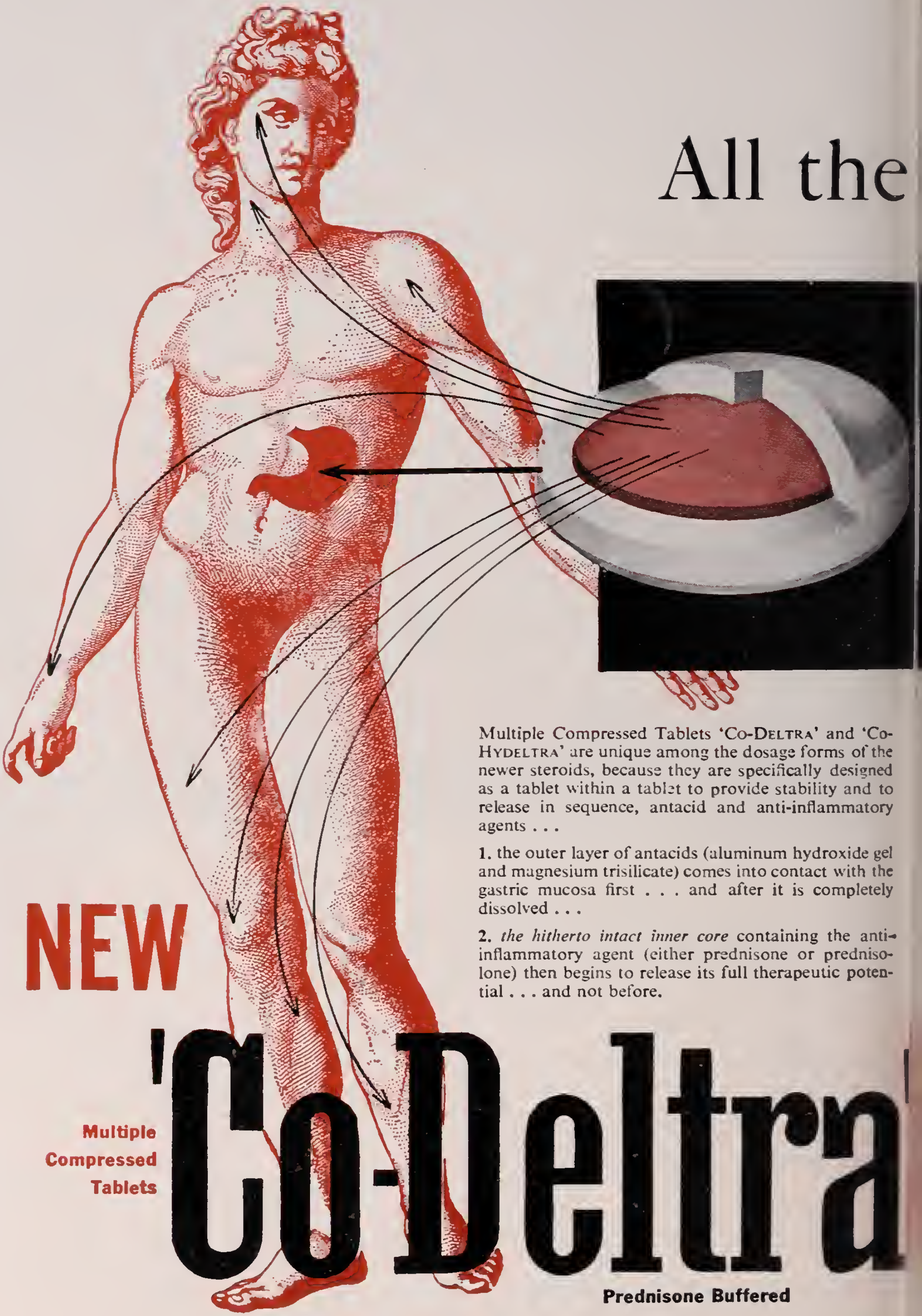
If you would like copies of this new timesaving Knox booklet for your practice, use the coupon below.

Chas. B. Knox Gelatine Company, Inc.
Professional Service Department SJ-16
Johnstown, N. Y.

Please send me.......copies of the new Knox "Sick and Convalescent" booklet.

YOUR NAME AND ADDRESS

All the



Multiple Compressed Tablets 'Co-Deltra' and 'Co-Hydeltra' are unique among the dosage forms of the newer steroids, because they are specifically designed as a tablet within a tablet to provide stability and to release in sequence, antacid and anti-inflammatory agents . . .

1. the outer layer of antacids (aluminum hydroxide gel and magnesium trisilicate) comes into contact with the gastric mucosa first . . . and after it is completely dissolved . . .

2. *the hitherto intact inner core* containing the anti-inflammatory agent (either prednisone or prednisolone) then begins to release its full therapeutic potential . . . and not before.

NEW

'Co-Deltra'

Multiple Compressed Tablets

Prednisone Buffered

benefits of prednisone and prednisolone plus positive antacid action to minimize gastric distress...

A reportedly higher incidence of gastric distress in patients receiving the newer steroids prednisone and prednisolone indicates the desirability of co-administering non-systemic antacids.[1]

To help the physician cope with this problem of gastric distress which might otherwise become an obstacle to therapy with the newer steroids . . . Multiple Compressed Tablets 'Co-Deltra' (Prednisone Buffered) and 'Co-Hydeltra' (Prednisolone Buffered) are now available.

'Co-Deltra' and 'Co-Hydeltra' are now available in bottles of 30 on your prescription. Each Multiple Compressed Tablet contains:

Prednisone or Prednisolone, 5 mg.; 300 mg. of dried aluminum hydroxide gel, U.S.P., and 50 mg. of magnesium trisilicate.

'Co-Deltra' and 'Co-Hydeltra'
are trade-marks of Merck & Co., Inc.

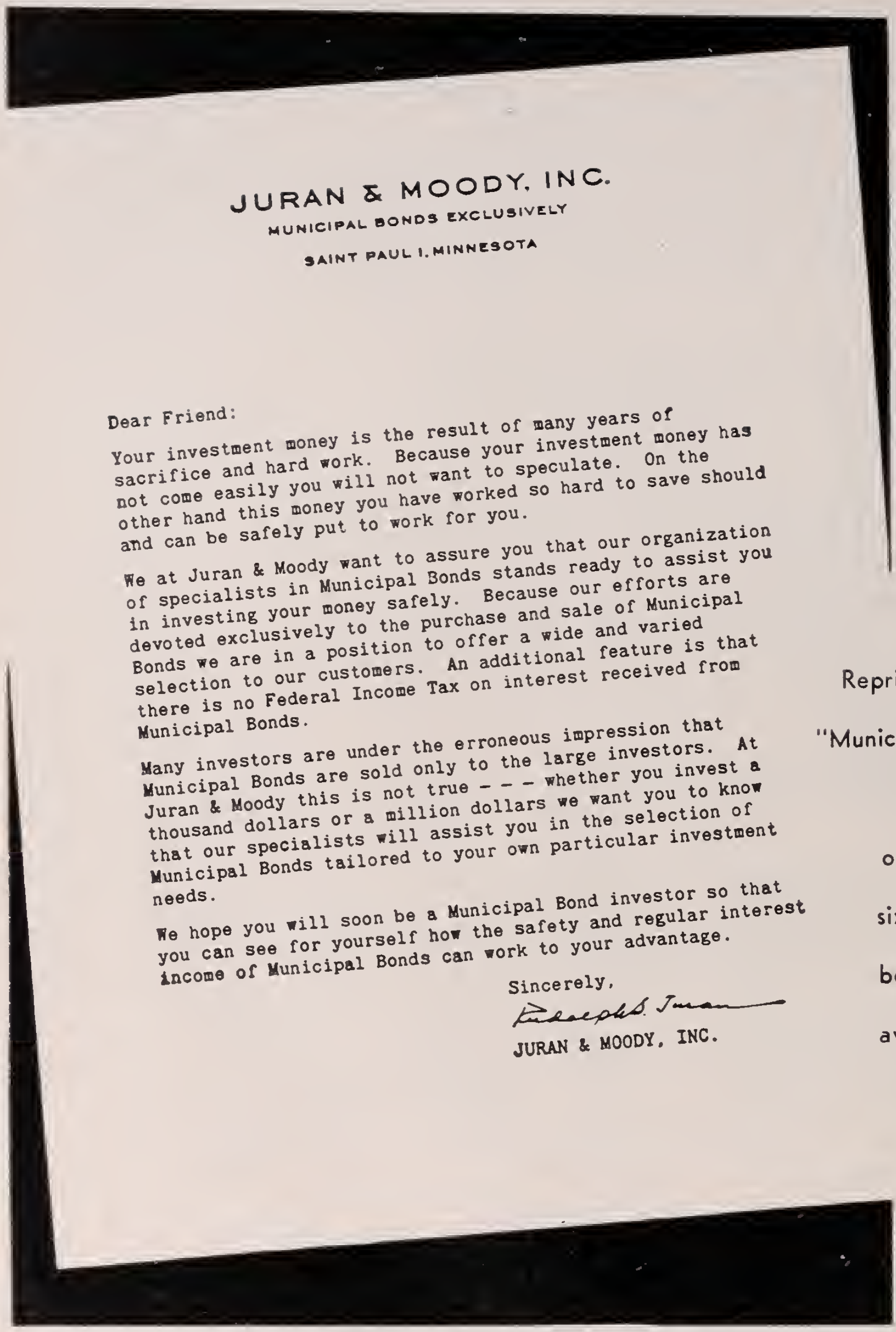
[1] Bollet, A. J., Black, R., and Bunim, J. J.: *J.A.M.A.* **158**: 459, June 11, 1955.

Co-Hydeltra'

Prednisolone Buffered

SHARP & DOHME

Philadelphia 1, Pa.
Division of Merck & Co., Inc.



JURAN & MOODY, INC.
MUNICIPAL BONDS EXCLUSIVELY
SAINT PAUL 1, MINNESOTA

Dear Friend:

Your investment money is the result of many years of sacrifice and hard work. Because your investment money has not come easily you will not want to speculate. On the other hand this money you have worked so hard to save should and can be safely put to work for you.

We at Juran & Moody want to assure you that our organization of specialists in Municipal Bonds stands ready to assist you in investing your money safely. Because our efforts are devoted exclusively to the purchase and sale of Municipal Bonds we are in a position to offer a wide and varied selection to our customers. An additional feature is that there is no Federal Income Tax on interest received from Municipal Bonds.

Many investors are under the erroneous impression that Municipal Bonds are sold only to the large investors. At Juran & Moody this is not true - - - whether you invest a thousand dollars or a million dollars we want you to know that our specialists will assist you in the selection of Municipal Bonds tailored to your own particular investment needs.

We hope you will soon be a Municipal Bond investor so that you can see for yourself how the safety and regular interest income of Municipal Bonds can work to your advantage.

Sincerely,

JURAN & MOODY, INC.

Reprinted from "Municipal Bonds and You" our colorful sixteen-page book that is available to you Free!

Name______________________________

Address____________________________

City____________________ State________

MM-4-6

JURAN & MOODY, INC.

Municipal Bonds Exclusively

Rand Tower
MINNEAPOLIS 2

93 East 6th St.
ST. PAUL 1
TELEPHONE: CApital 4-9661

Citizens and Southern Building
ATLANTA, GA.

Upjohn

Ulcer protection that lasts all night:

Pamine* BROMIDE

Tablets

Each tablet contains:
Methscopolamine bromide .... 2.5 mg.

Average dosage (ulcer):
One tablet one-half hour before meals, and 1 to 2 tablets at bedtime.

Supplied: Bottles of 100 and 500 tablets

Syrup

Each 5 cc. (approx. 1 tsp.) contains:
Methscopolamine bromide .... 1.25 mg.

Dosage:
1 to 2 teaspoonfuls three or four times daily.

Supplied: Bottles of 4 fluidounces

Sterile Solution

Each cc. contains:
Methscopolamine bromide .... 1 mg.

Dosage:
0.25 to 1.0 mg. (¼ to 1 cc.), at intervals of 6 to 8 hours, subcutaneously or intramuscularly.

Supplied: Vials of 1 cc.

*TRADEMARK, REG. U. S. PAT. OFF.—THE UPJOHN BRAND OF METHSCOPOLAMINE

The Upjohn Company, Kalamazoo, Michigan

A NEW

Chemical Compound

for the treatment of

PEPTIC ULCERS and HYPERACIDITY

GLYCAMINE®

TABLETS

GLYCAMINE BRAND OF HYDROXY ALUMINUM
MAGNESIUM AMINOACETATE
PAT. PEND.

PROMPT, LONG LASTING RELIEF — One tablet is sufficient to neutralize excess acidity and maintain optimum pH for 4½ hours.

A NEW CHEMICAL COMPOUND — Designed to perform a specific function . . . not a mixture of alkalis. Will not disturb acid-base balance.

RE-ESTABLISHES NORMAL DIGESTION — Does not affect enzymatic activity. Improves patient well being.

CONTROLLED ACTION — Does not stimulate acid secretion or alkalosis. No acid rebound.

NON-SYSTEMIC — Neither constipating nor laxative. Demulcent protective coating covers abraded mucosa.

COMPATIBLE — With antispasmodics and anticholinergics. Reduces gastric distress caused by many drugs.

LOW DOSAGE — Only four pleasant tasting, chew-up tablets daily. Economical to use. Assures better patient co-operation.

AVAILABLE — In bottles of 100, 500 and 1000 tablets in all drug stores.

For latest professional information and samples write

DALCO PHARMACAL CO.

Minneapolis 2, Minn.

Division of

JOSEPH E. DAHL CO., Minneapolis and St. Paul

Throughout the world...

... use in millions of cases and reports by thousands of physicians have built confidence in

TERRAMYCIN®

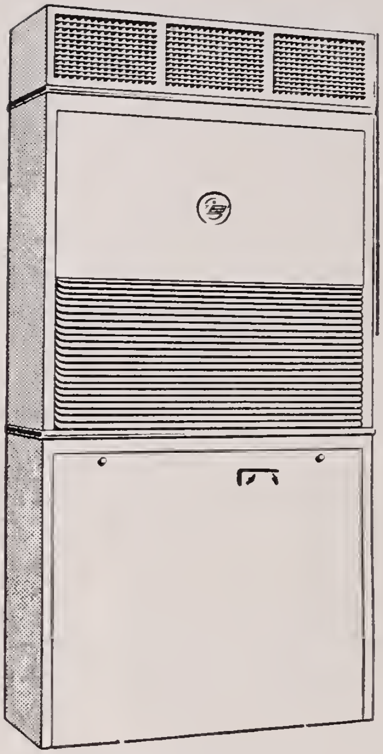
BRAND OF OXYTETRACYCLINE

... well-tolerated, rapidly effective broad-spectrum antibiotic of choice.

Capsules, tablets, taste-tempting liquid forms and special preparations for parenteral, topical and ophthalmic use.

Pfizer PFIZER LABORATORIES, *Division, Chas. Pfizer & Co., Inc.*, Brooklyn 6, N. Y.

Your patients don't ask for it . . . BUT . . .



Airtemp
DIVISION
CHRYSLER CORP

AIR CONDITIONING IS AN INVESTMENT THAT PAYS FOR ITSELF . . . *fast!*

Airtemp air conditioning puts your patients at ease and increases office efficiency when outside temperatures soar. Airtemp engineering offers trouble-free performance unmatched in the air conditioning field.

"Packaged" units for every size office or clinic.

Completely contained units, quickly installed without duct work or remodeling. Sizes from 2 to 30 horsepower . . . 13 different models.

WATERLESS AIR CONDITIONING INSTALLED AS EASILY AS A REFRIGERATOR

No plumbing . . no water needed! Saves floor space. Entire unit warranted for 5 years.

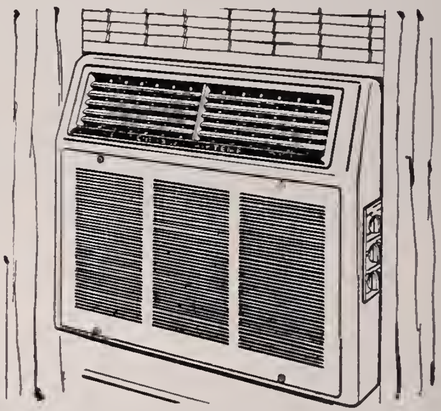
New!

All-in-window

ROOM AIR CONDITIONERS

Does not protrude beyond window sill.
Exclusive with AIRTEMP

A new . . . *all new* . . . streamlined room air conditioner that is completely contained within the window. Completely automatic. Filters, de-humidifies, and cools air in one operation. Adjustable fins eliminate drafts. Many sizes for any need. Also units for casement windows. No water or plumbing needed. Low installation cost.

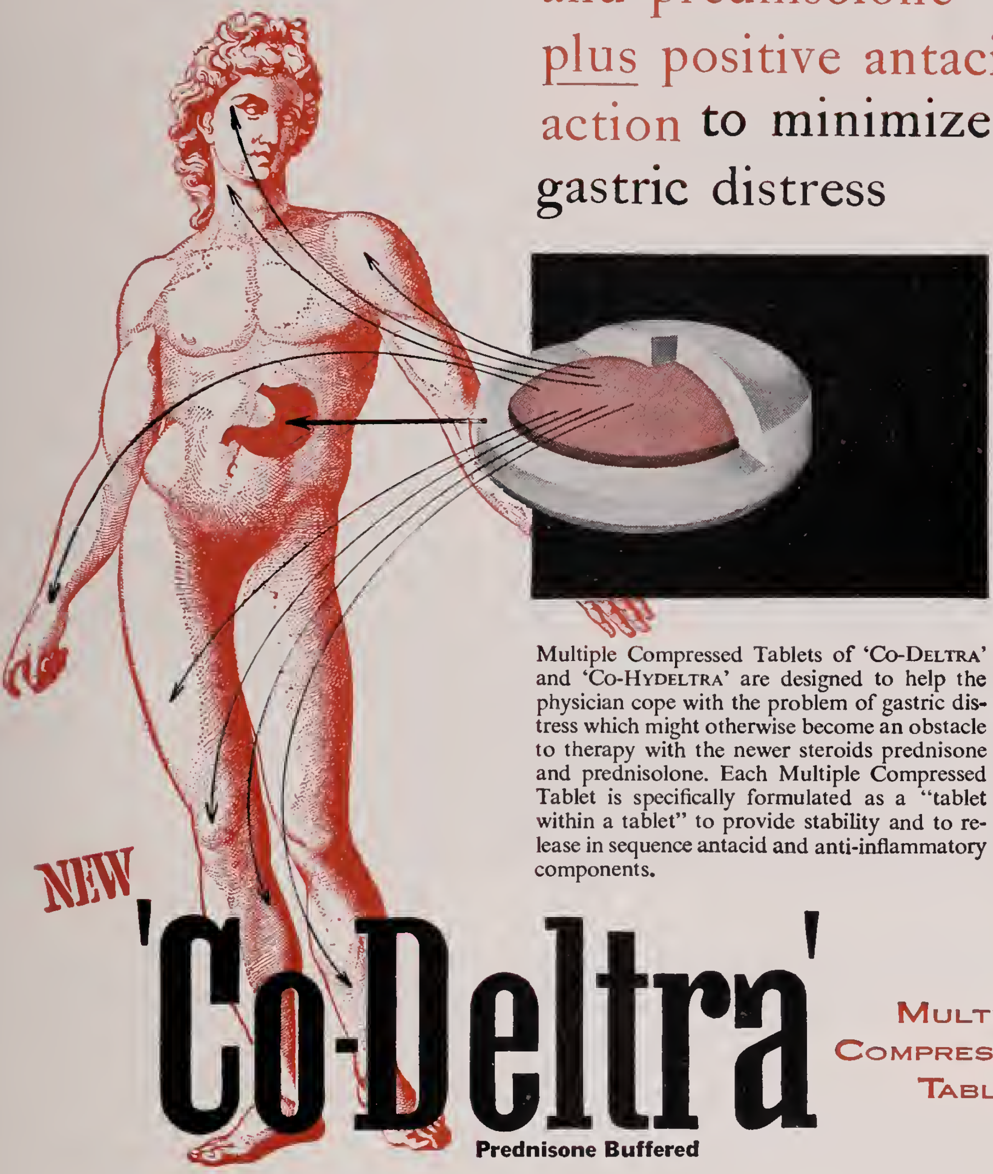


There is an Airtemp dealer near you who will give you a survey and estimate FREE!

Globe Inc.

Exclusive distributor
MINNEAPOLIS—MANKATO—BISMARCK

All the benefits of prednisone and prednisolone plus positive antacid action to minimize gastric distress



Multiple Compressed Tablets of 'Co-Deltra' and 'Co-Hydeltra' are designed to help the physician cope with the problem of gastric distress which might otherwise become an obstacle to therapy with the newer steroids prednisone and prednisolone. Each Multiple Compressed Tablet is specifically formulated as a "tablet within a tablet" to provide stability and to release in sequence antacid and anti-inflammatory components.

NEW

'Co-Deltra'

Prednisone Buffered

MULTIPLE
COMPRESSED
TABLETS

and

'Co-Hydeltra'

Prednisolone Buffered

Supplied: Multiple Compressed Tablets of 'Co-Deltra' and 'Co-Hydeltra', each containing 5 mg. prednisone or prednisolone, 300 mg. of dried aluminum hydroxide gel, U.S.P., and 50 mg. of magnesium trisilicate, U.S.P., bottles of 30 tablets.

SHARP & DOHME
Philadelphia 1, Pa.
Division of Merck & Co., Inc.

'Co-Deltra' and 'Co-Hydeltra' are the trademarks of Merck & Co., Inc.

prevents postpartum hemorrhage
speeds uterine involution
Lilly
QUALITY / RESEARCH / INTEGRITY

'Ergotrate Maleate'

(ERGONOVINE MALEATE, LILLY)

. . . produces rapid and sustained contraction of the postpartum uterus

'Ergotrate Maleate' almost completely eliminates the incidence of postpartum hemorrhage due to uterine atony. Administered during the puerperium, 'Ergotrate Maleate' increases the rate, extent, and regularity of uterine involution; decreases the amount and sanguineous character of the lochia; and decreases puerperal morbidity due to uterine infection.

Supplied:

Ampoules of 0.2 mg. in 1 cc.
Tablets of 0.2 mg.

DOSAGE: Generally, 0.2 to 0.4 mg. I.V. or I.M. immediately following delivery of placenta. Thereafter, 0.2 to 0.4 mg. three or four times daily for two weeks.

ELI LILLY AND COMPANY • INDIANAPOLIS 6, INDIANA, U.S.A.

659002

Original Contributions

Biliary Stricture

J. BRADLEY AUST, M.D., and
RICHARD L. VARCO, M.D.
Minneapolis, Minnesota

A SIMPLE and inclusive definition of biliary stricture is difficult to formulate because the anatomical variations are so numerous. The types range from a localized stenosis, which the term “stricture” first brings to mind, to the complete urgical absence of most of the extrahepatic ducts. Inevitably, all stages between these extremes exist. Their clinical counterparts can be equally diverse.

Perhaps a stricture is best considered as a linical concept wherein obstruction of the extrahepatic biliary system other than solely from calulus, provokes one or more of the symptoms of aundice, cholangitis or pain. The etiological mechanisms can be congenital, neoplastic, inlammatory, or traumatic. As with most other persons writing on this subject, our interest in his study centers around those clinical instances rising from surgical injury. In this group of adult patients to be presented, all cases, save one, were of this traumatic type and occurred following he operations of cholecystectomy, cholecystostomy r choledochostomy. There was one case which ad had no prior operation. In this person the lesion was classified as of inflammatory origin.

History

Although the first references to biliary stricture ate from the French literature of the 1820's, when oth Andral in 1824[1] and Bauillaud in 1827[2] reorted this clinical symptom complex secondary o inflammatory and neoplastic causes, it was not ntil after cholecystectomy was introduced by Langenbuch[6] in 1882, and his contemporary urgeons used this procedure, that biliary strictures became a serious medical problem. One cannot isregard the coincidence between an increasing umber of gall bladder operations and a heightened prevalence of biliary strictures. Doyen, in 1892, was the first to report the use of end-to-end anastomosis for a divided common bile duct. Sprengel in 1891 recorded the successful anastomosis of the common bile duct to the duodenum. During the intervening years since then a wide variety of surgical techniques have been proposed and tried in order to re-establish the continuity of an injured extra-hepatic biliary duct either to itself or to the intestine. In 1918[4] and 1936[5] Eliot of New York, based on his collection of case reports from the literature, attempted to classify and evaluate the results of treatment in terms of the type of surgical repair. The experience at the Lahey Clinic was described in 1947 by Cattell,[3] and in 1950 by Lahey,[7] the latter reporting on 280 cases. There had been a two-year follow-up in 229 of them. This group achieved 73 per cent favorable results for either the end-to-end or the choledocho-intestinal anastomoses. Walters has summarized the surgical accomplishments with 254 biliary stricture cases. Choledochoduodenostomy was the most common operation at the Mayo Clinic from 1924 to 1947. Eighty-two per cent of these persons had satisfactory results.

Analysis of the Present Series

Between 1935 and 1955, seventy consecutive adults have been treated surgically for biliary stricture.

TABLE I. DISTRIBUTION OF SEX

Male	9
Female	61

TABLE II. DISTRIBUTION OF AGE

10-19	20-29	30-39	40-49	50-59	60-69	70-79
1	10	13	23	15	6	2

The sex and age distribution indicate that the average patient was a woman between forty and fifty years of age (Tables I and II).

From the Department of Surgery, University of Minnesota Medical School and the University of Minnesota ospitals.

We believe it is significant that two-thirds of all the persons afflicted were less than fifty years old. In this series, a young mother all too frequently was stricken while in reasonably good health. Ninety-five per cent (fifty-nine of the sixty-two cases available) have been checked upon as out-patients for at least two years after their last operation. Three patients have been lost to follow-up despite protracted attempts to contact them. An additional eight cases remain under observation for intervals up to two years. Questionnaires were sent to all available patients so that the information would be current. The family physician's appraisal of the patient's health was also sought.

The following classification of operative procedures was devised to catalogue the various methods employed in dealing with the biliary stricture problem at the University of Minnesota Hospitals:

I. Total external biliary fistula.
II. Partial external biliary fistula with T-tube.
  A. Stricture dilated and T-tube inserted through this area.
  B. Stricture incised and closed over T-tube.
  C. Stricture excised with T-tube bridging gap.
  D. Stricture excised with T-tube brought through the line of anastomosis.
  E. Stricture excised with T-tube brought out distal to line of anastomosis.
III. Internal biliary fistula.
  A. Choledochogastrostomy.
  B. Choledochoduodenostomy.
  C. Choledochojejunostomy.
IV. Dissection failure—i.e., failure to find the biliary duct proximal to the stricture.

The results have been classified as:

(S) Satisfactory
(I) Improved but with residual symptoms
(U) Unsatisfactory
(L) Follow-up inadequate (less than two years or lost)
(E) Expired

Our attempt at an evaluation of the results has been necessarily arbitrary. In the terminology used the distinction in a given case between a satisfactory and an improved result might be difficult or impossible. Any patient who has had previous unsuccessful attempts at surgical repair can show some liver damage as a result of recurrent biliary tract infection and obstruction. An otherwise effective anatomical result may then fail to resolve all lingering aspects of hepatic disease. The exact distinction between this result and a le
perfect biliary tract restoration in another patie
who has been without as much associated liv
injury, becomes conjectural. The "best" resu
the first individual could attain might have to b
scored as an improved result. The other thre
end result categories were usually more easil
determined; and, those patients with recurre
jaundice or cholangitis were obviously unsati
factory.

TABLE III. OVER-ALL OPERATIONS PERFORMED

Patients	70	
Operations elsewhere	104	
Operations here	109	
Total operations	213	3.04/pt.
Operations for stricture here	89	1.27/pt.

Table III lists the number of surgical pr
cedures, and as can be noted, each patient unde
went an average of three operations. In additio
to the original surgery, many persons had o
or more repairs prior to coming to the Universi
of Minnesota Hospitals. The discrepancy betwe
the number of operations performed here an
the number of operations for stricture performe
here arises from the need for additional surge
either for complications or for the sequelae of t
stricture operations. For instance, gastric resectio
for duodenal ulcer (probably) provoked by t
stricture and its consequences, was required in tw
individuals.

The symptom complex of jaundice and/
chills and fever following biliary surge
regularly identified for us the case as one with
stricture. All but six patients exhibited jaundi
on admission and three of these exceptions had
total external biliary fistula. The other three ha
been icteric upon prior occasion. Thirty-three
the seventy patients (47 per cent) came he
with chills and fever or had recently exhibit
these findings.

An analysis of the results of the several metho
of correction as attempted by a changing staff
the University of Minnesota Hospitals, sugge
certain considerations. The most common repa
attempted was an end-to-end anastomosis with
limb of the T-tube brought out through the line
the anastomosis (Table IV; II, D). Recurrenc
were common (and well-night predictable) aft
this procedure. The discharge of abunda
volumes of bile through the abdominal drai
during the postoperative period virtually assur
this likelihood. After the omission of those patien

ith an inadequate follow-up and the cases expiring postoperatively, only 40 per cent, or ten twenty-five persons so treated, had a satisctory end result. When the procedure was therwise comparable but for the simple expedient f bringing the T-tube out distal or proximal to he suture line, the outlook was distinctly more avorable (eight of eleven could be classified as atisfactory or improved) (Table IV; II, E). t is pertinent to note that this type of recontruction is possible (and probably successful) nly in persons with a localized stricture. Here he new union can easily be achieved without ither undue shortening or disruptive tension. uccess will depend also on having the duct iameters almost equal proximal and distal. We ere surprised to find that one individual with a ocalized stenotic type of stricture was satisactorily managed by a longitudinal incision and transverse closure. Mere dilatation of this ocalized type of stricture followed by the insertion f a T-tube was a long term failure in six of en attempts.

TABLE IV. CLASSIFICATION OF SURGICAL PROCEDURES

Results	I	II						III				IV
		A	B	C	D	E	Total	A	B	C	Total	
S(Satisfactory)		4	1	1	10	6	22		3	8	11	
I(Improved)				1		2	3		1	1	2	
U(Unsatisfactory)	3	6			15	3	24	1	1	1	3	
L(Follow-up inadequate)		1			2	1	4		4	3	7	
E(Expired)	3				2	1	3		1		1	3
No. of operations	6	11	1	2	29	13	56	1	10	13	24	3

ABLE V. OPERATIVE AND PATIENT MORTALITY

perations	Deaths	Per Cent
109	10	9.2
atient Mortality * (adequate follow-up)	15**	25.4

*Patients having two year follow-up.
*There were five late deaths considered due to stricture.

The results of choledochointestinal anastomosis ave been consistently better. Thirteen of sixteen 81 per cent) (Table IV; III, B, C) persons so reated secured a satisfactory or improved result. This percentage of succeses was even higher when he repair consisted of a choledochojejunostomy. The outcome in nine of ten such cases was satisactory. This result assumes additional significance if it is appreciated that this particular procedure (choledochojejunostomy) was often employed when other methods had proven unsatisfactory.

The consequences of dissection failures are self-incriminatory. Unless the technical problems were solved, the patient died.

TABLE VI. MORTALITY ANALYSIS

Type	Cases	Time	Cause
I. Dissection Failures	M.A.	P.O.	Failure to find proximal duct
	M.S.	P.O.	Failure to find stricture—biliary cirrhosis, hepatitis
	J.S.*	P.O.	Failure to find stricture—thought to have ca. of pancreas
II. Hemorrhages	C.B.**	P.O.	Hemorrhage
	M.F.**	P.O.	Hemorrhage and subphrenic abscess
	K.H.	P.O.	Hemorrhage
III. Infection***	A.E.	P O.	Peritonitis, subphrenic abscess, pancreatitis
	D.M.	P.O.	Liver abscess, biliary cirrhosis
	P.B.	P.O.	Liver abscess
	O.W.	P.O.	Pancreatitis, interstitial nephritis, bilateral atelectasis
IV. Late	A.B.	1 yr.	Hepatic artery injured and sutured at surgery—expired from ruptured aneurysm of hepatic artery.
	R.G.	13 yrs.	Expired following surgery for bleeding DU—extensive biliary cirrhosis.
	E.S.	6 mos.	Liver abscesses, suppurative cholangitis, recurrence of stricture.
	E.R.	6 mos.	Recurrence of stricture bleeding.
	M.R.	5 yrs.	Recurrence of stricture, biliary cirrhosis.

*Only case not having had previous biliary surgery
**Both cases prior to 1936
***All cases have been since 1942

The operative mortality (10/109—9.2 per cent) for this series of procedures is listed in Table V. The overall mortality of 25 per cent, including the late deaths to which the stricture contributed, emphasizes the gravity of this surgical problem. It is a benign lesion, but I don't think anyone would refer to it as a "benign condition." This is an unfair play on words.

A study of the deaths reveals four main causes:

TABLE VII. OVERALL RESULTS

	Number	Per Cent
Satisfactory (S)	34	48
Improved (I)	4	6
Unsatisfactory (U)	6	9
Follow-up inadequate (L)	11	16
Expired (E)	15	21
Total	70	100

dissection failures, hemorrhage, infection and late sequelae (Table VI). Two of three patients with fatal hemorrhage succumbed prior to the advent of vitamin K therapy. The deaths from infection occurred despite combinations of antibiotic therapy. Of the late deaths one seems attributable directly to the surgical procedure, while the other four arose as a consequence of the unresolved stricture problem.

Discussion

The tragic aftermaths of this iatrogenic affliction have been impressed upon us during the hours spent reading the often voluminous hospital charts of these patients. Effective prophylaxis against this regrettable situation is surely far superior to the best possible reconstructive procedure. The latter will always entail a period of pain and an element of anesthetic and operative risk that would not have been required had the initial procedure gone well. The experience of many surgeons, each having done more than a thousand operations upon the biliary tract without provoking this grave outcome, confirms the belief that the standard types of operations on the gall bladder should be devoid of such disasters.

We wish to avoid knocking into tree after tree while trying to get out of the forest, but do desire to attract attention to certain particularly distressing features of the common duct stricture problem. In two-thirds of the patients of this series, this tragedy fell upon women under fifty years of age. The expense to someone with a young mother away from home for a protracted interval during the mid-period of life, could scarcely be less serious economically were it to have happened to the wage-earning father. The other losses to the community and to the family are incalculable. Over and beyond the time spent in the hospital are often prolonged convalescent interludes, or, worse, those of recurrent partial disability. In yet other instances the patient never quite regains full health. Furthermore, undesirable residues of this condition are difficult to eliminate. Biliary cirrhosis, duodenal ulceration, portal hypertension from inflammatory obstruction, and yet other sequelae have developed in these people as a consequence of the common duct injury and the trauma secondary to attempts at its correction. The deadly seriousness of this problem is pointed up by the mortality of 25 per cent. These deaths, we believe, are largely ascribable to the stricture and/or to the subsequent procedures designed to correct it.

There can hardly be any reasonable opposition, it would seem, to emphasis on, and devotion to, the practice of those sugical techniques that will effectively prevent the occurrence of a common duct stricture. This is surely the challenging obligation in all centers training surgeons. The technical cautions to be observed are well described in the medical literature dealing with surgery for this area. Briefly, the operator must be indoctrinated never to divide any structure presumed to be the cystic duct until the common duct proper and the common hepatic duct have been thoroughly exposed and unquestionably identified. The apparent presence of anomalous structures should alert anew the prudent surgeon. Secondly, any untoward arterial bleeding from an inadvertently divided vessel should be managed by digital compression via Winslow's foramen while the specific leak is carefully sought for and forceps-point hemostasis secured. Inadequate dissection followed by clamping, cutting, and mass ligation before the complete identification of these specific ductal tributaries; indiscriminate, awkward, hasty, grasping instrumentation for a bleeding site in the portal hilus; and a common duct stricture is conceived. When this offspring, disturbing to contemplate, reaches full growth, few would care to acknowledge the paternity.

The next phase to be considered at this early stage in the growth of this problem child is the matter of affirming its existence. This diagnosis may become self evident, on an initial careful study of the history and corresponding work-up of the patient. Customarily, this identification will be more readily made by those persons less intimately involved with the creation.

There are certain clinical features supporting the diagnosis of a biliary stricture following a cholecystectomy. The development of very profuse, persistent bile discharge from wound or drainage site after cholecystectomy should alert one to the fact that the duct may have been severed. Those atients who become unremittently jaundiced and ave a minimal pigment content in the stools from he day of surgery henceforth, suggest that the uct has been tied off. Another identifiable group represented by those who recover from their nmediate surgery but sometime thereafter deelop the symptom complex of chills, fever and ght upper quadrant pain associated with icterus. 'hese late occurrences of stricture usually arise rom scarring at the site of a previous injury. Iere, as the fibrous tissue replaces the damaged iucosa the normal flow of bile is slowly throttled. t should be mentioned that this latter clinical icture can be perfectly simulated by choledochothiasis and operative exploration may be the only iethod of making a differentiation.

In the fallacious hope that an individual with stricture might spontaneously be cured through on-operative management, there is at times unue procrastination before electing effective surical therapy. This tendency is most pronounced ollowing a stricture repair that turns out unsatisactorily and the feeling waxes with one's memory f heightened tribulations during the previous fforts. Perhaps the responsible surgeon rememers these moments of trial and mentally rejects he unwelcome and ominous portent of recurrent hills, fever, and jaundice. This is indeed regretable, for biliary cirrhosis secondary to recurrent bstruction and cholangitis may progress to irreprable liver damage. In addition, recurrent bouts f cholangitis can so destroy the ductal mucosa hat a satisfactory repair becomes almost impossile. It seems wiser therefore to construe the onset f the above-mentioned symptom complex, following the removal of a T-tube or a similar splint, as recurrence of the stricture. With this decision nade, appropriate re-operative therapy is the raional course.

The obvious and traditional method of repair as been end-to-end anastomosis of the strictured luct. In its idealized form the normal anatomy is hereby restored. Though often technically diffiult, it can be accomplished, after a fashion, even vhen a large portion of the duct is absent. As ahey and his colleagues have shown, it is possible o expose the proximal common bile duct in the ubstance of the pancreas and, by mobilizing the luodenum, approximate the duct ends in a high ercentage of cases. With some temerity we sugest that perhaps the results would be superior if o frequent a recourse to end-to-end union were not employed as the method of choice—particularly in those cases where either a disproportion of stoma or tension exists. Moreover, if end-to-end anastomosis is used, our own experience as well as that of others indicates that any T-tube used must be brought out through a new opening in the duct wall well away from the lines of anastomosis. Proponents of end-to-end anastomosis contend that the sphincter of Oddi is essential for the prevention of intestinal content regurgitation into the biliary tract, if we are to avoid subsequent bouts of cholangitis for the patient. They, therefore, reserve choledocho-intestinal anastomosis for individuals in whom end-to-end anastomosis is not technically feasible.

Considerable evidence against this concept can be found in the evaluation of spontaneous, asymptomatic, internal biliary fistulas which cause no symptoms as long as they remain unobstructed. The experience of many surgeons has been that a choledocho-intestinal anastomosis does not cause cholangitis when this stoma remains free of obstruction. Finally, symptoms from this type of biliary tract drainage are habitually absent, when the operation is done for reasons other than stricture. Also in favor of the choledocho-intestinal union as compared to the end-to-end anastomosis, is the greater simplicity of the dissection. The surgeon has to find only the proximal end of the duct. The ease of the repair is likewise enhanced. The difficulties of precise end-to-end anastomosis where the duct ends are of unequal diameter are well known and evoke no surgical serenity in the post-operative moments of reflection.

We have approached this subject without rigidly preconceived ideas as to which technique might be the most satisfactory method of repair. With the evidence at hand we are now convinced that a uniformly superior result can be expected from a well-done, mucosa-to-mucosa, tension free, choledocho-intestinal anastomosis. Case analyses from both the Mayo Clinic and Lahey Clinic material reveal comparable accomplishment with either method, but the authors express the opinion that choledocho-intestinal anastomosis should be reserved for the more difficult of the stricture types, i.e., those in which end-to-end anastomoses are not practicable. The outcome in their hands was comparable, although they used the former preferentially in the worst cases. Because they noted as well that the choledocho-intestinal procedure was more easily performed, perhaps the choledocho-intestinal anastomosis should be re-evaluated. It may be the operation of choice rather than the method attempted only when end-to-end anastomosis is not easily done or has been recurrently unsuccessful. Admittedly, there are certain disadvantages to the Roux-en-Y type of choledocho-jejunostomy that is constructed without provision for bile re-entrance into the duodenum. This results in a form of the Mann-Williamson ulcer abetting operation. Two of our patients in this group subsequently required treatment for a duodenal ulcer. To avoid this, the jejunal limb can be re-anastomosed back onto the duedenum. On this basis and where technically possible, a choledocho-duodenostomy may be therefore the choledocho-intestinal operation of choice for biliary stricture.

From personal skirmishes with the biliary stricture problem a plan has gradually developed that has proved workable and useful. The procedure to be described carries no allegations of newness or originality but does possess for us advantages in surgical exposure and accomplishment that incline one towards its further testing.

Insofar as possible, prothrombin deficits are corrected and any serious contractions of blood volume and red cell mass are restored to normal values. The effectiveness of wide spectrum antibiotics is tested in all persons with fever and chills. Other antibiotic preparations capable of eliminating the usual bacterial flora of the intestinal tract are customarily but not always provided. An indwelling nasal gastric tube is connected to suction for several hours prior to the operation. This in combination with the antibiotics, permits the surgeon to work more advantageously in an abdomen where all the bowel within the visible limits freed by his dissection, is found to be stool free and collapsed.

A thoraco-abdominal incision well up the right seventh or eighth interspace and then transversely across the upper recti has much to recommend it. Once the diaphragm has been incised, the right lobe of the liver can be loosened from surrounding adhesions, delivered laterally and superiorly and dissection of the portal hilus is thereby considerably facilitated. By sharp instrument technique the hepatic artery and its major divisions are extricated from the surrounding scar tissue. The dissection is then approached from lateral to medial and begins at the lower edge of the right lobe of the liver. Any adherent duodenum or jejunum that was used in an earlier procedure should be cut free and next the overlying tissues cleaned away until the edge of the portal vein is quite evident. Now the residual of the common duct must be between these dissections and the surgeon need only remove the thickened hepatic capsule and cone out the intervening scar to yield the bile duct(s). We believe ultimate success in each case hinges on the surgeon's insistence on cutting far enough back on this structure so that all granulomatous, scarred, biliary tract is removed. Unless one makes this sacrifice of tissue back to good and healthy duct wall, a failure by restricturing becomes almost predictable.

Having developed by this amputation a fresh mucosal surface for the new stoma (or even up to three intra-hepatic duct ostia when it becomes necessary to curette that much liver away in order to secure an ample length of healthy bile tract), it can then be united mucosa-to-mucosa either to the duodenum or to a jejunal loop. For this anastomosis we prefer interrupted, fine (0000 or 00000) silk. At times it may be necessary to place the entire circumference of sutures, tagging each, before tieing a single one. Once the gut is approximated to the bile duct no room remains for accurate stitch placement. Final tacking bites approximate the serosal surface to the adjacent thickened liver capsule to minimize distraction across the suture line. No internal splints are usually inserted, for they are unnecessary if the anastomosis is well done. If it is not, serious leakage will occur postoperatively. A new stricture will almost surely develop. And, any tube through the anastomosis will provide scant protection against the bile peritonitis and none against the recurrent stricture. Furthermore, almost all tubes are provocative of some tissue reaction when in contact with a raw surface. Theoretically and perhaps practically, they are capable of inciting an excessive scarring tendency at the suture line.

Before completion of the operation, continuous catheter drainage is provided for the thoracic space and the entire incision closed with silk. All forms of abdominal drains are omitted. Throughout the dissection the bleeding may be steady and has an aggravating tendency to obscure the field. It further enhances the problem of identifying vital anatomical landmarks. Flushing these oozing surfaces with icebox cold, rather than warm

Ringer's solution will assist in controlling the seepage from the innumerable capillaries that have been divided. All blood lost should be replaced volume for volume. These procedures often require many hours of unhurried work. Time so spent becomes a rewarding experience when a successful result retrieves for the patient a health that has been devastated by a common duct stricture.

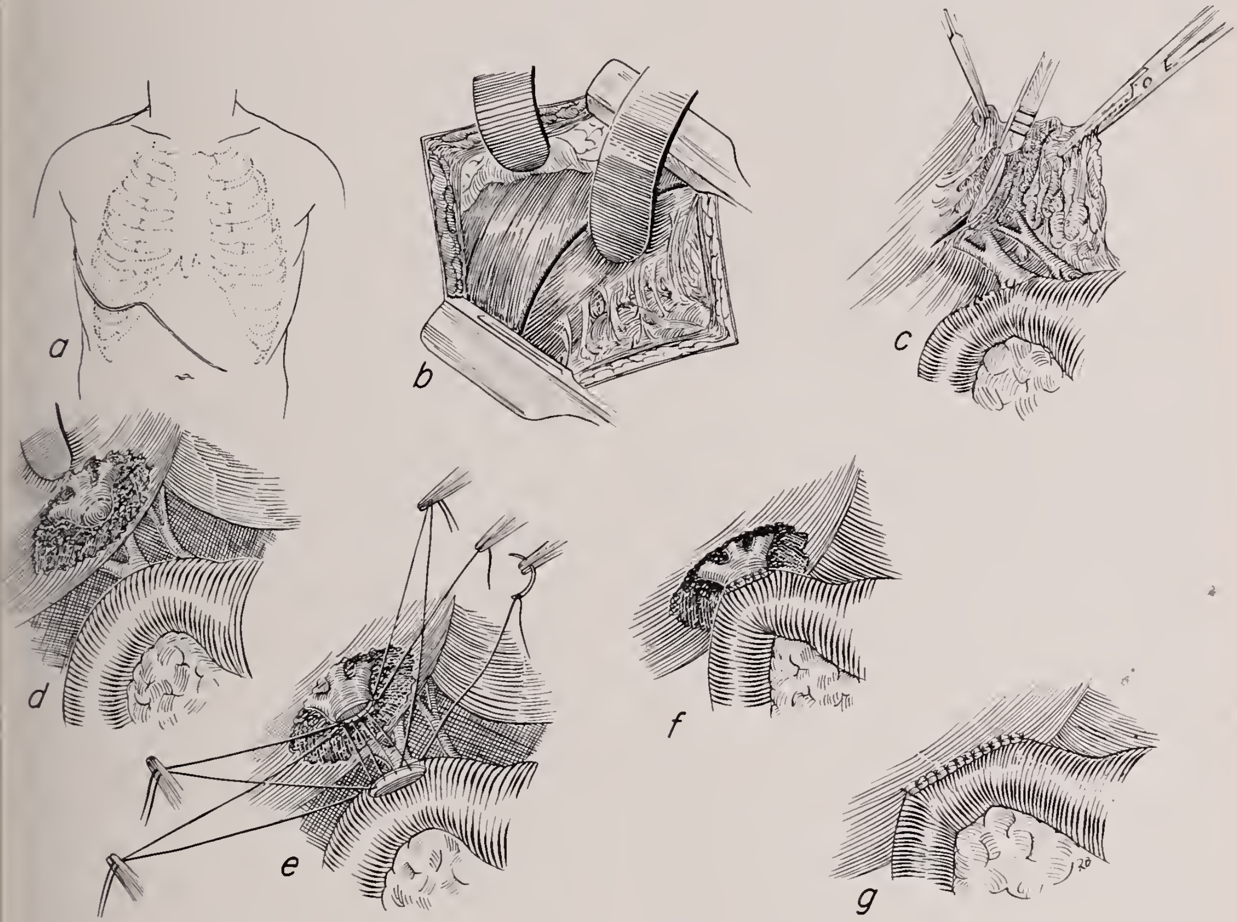


Fig. 1. Technique of exposure and repair of biliary stricture by choledocho-duodenostomy. (a) Line of incision. (b) Exposure showing right lobe of liver. (c) Dissection of hilus of liver to demonstrate portal vein and hepatic artery. (d) Coned out liver hilus to disclose blind end of biliary duct(s). (e) Placement of mucosa-to-mucosa stitches. (f) Completed anastomosis. (g) Buttressing layer duodenum to liver capsule.

Summary

1. The results of surgery for biliary stricture on seventy patients seen at the University of Minnesota Hospitals since 1935 have been reported.

2. It is again emphasized that this is essentially a preventable disease; it is responsible for significant patient morbidity, often demanding multiple operations, prolonged hospitalization, and sometimes produces a permanent disability. As well, there is a mortality rate as high as that recorded for many forms of gastrointestinal malignancy.

3. The traditional concept of end-to-end anastomosis with preservation of the sphincter of Oddi as the ideal form of treatment, is re-examined and questioned. Our results, as well as our analyses of the evidence from earlier publications show that equally satisfactory results can be obtained with choledocho-intestinal anastomoses.

References

1. Andral: Archives Generales de Medicine, Paris. VI:161-173, 1824.
2. Bauillaud, J.: Journal Complimentaire du Dictionaire des Sciences Medicales, Paris. XXIX: 1827.
3. Cattell, Richard: Benign strictures of biliary ducts. J.A.M.A., 134:235-240, 1947.

(Continued on Page 218)

Pigmented Villonodular Synovitis

A Clinical and Pathologic Study

WILLIAM G. ATMORE, M.D
Duluth, Minnesot
DAVID C. DAHLIN, M.D., an
RALPH K. GHORMLEY, M.D
Rochester, Minnesot

THE dark-brown to yellow villous and nodular projections from the synovial surface into a joint affected by pigmented villonodular synovitis produce a dramatic gross picture that is virtually pathognomonic of the condition. The relative rarity of this disease delayed an understanding of its pathologic evolution and natural history until the classic description by Jaffe and associates in 1941. A review of the literature and an analysis of their personal experience with twenty cases formed the basis of their article. Previous observers had recorded fifty-seven examples of the diffuse and circumscribed forms of pigmented villonodular synovitis of joints under a variety of names. There is no significant sex predilection for this disease, which, in its diffuse form, is common in young adults. The average age of the patients affected by the focal synovial lesions is older.

As just indicated, pigmented villonodular synovitis may affect the entire joint or may present as a focal tumor in an otherwise normal synovium. It may be debated whether the localized, often pedunculated, capsular or intra-articular growths are basically the same as the diffuse lesions. Evidence indicates that the tumor commonly called "xanthoma," or "benign synovioma of tendon sheaths," is only a different manifestation of the proliferative process in classic diffuse pigmented villonodular synovitis.[1-4] The focal lesions in the joint may look just like the characteristically solid tumors of tendon sheaths or they may be villous and spongelike, as in the diffuse lesions. Additional evidence that tenosynovial "xanthomas" and diffuse pigmented villonodular synoviti are closely related is the observation that th nodular masses in the latter disease are morphologically identical to the former. In rare instances,[1,5] bursae not connected with joints ar affected by a proliferative process of the typ seen in the diffuse articular lesions. This proliferative lesion involving the hip joint but presenting as a mass in the femoral triangle and a an intra-abdominal tumor has been reported.[6]

There are now slightly more than 100 recorded examples of pigmented villonodular synovitis o joints. The involvement was diffuse in somewhat less than half of these. All of the lesions were in the lower extremity. Except for six lesions in the hip[7-9] and seventeen in the ankle and tarsal bones,[1,3,10-12] all lesions involved the knee joint The extremely rare examples of bursal involvement have been seen in the region of the knee, the ankle and the iliopsoas muscle. More than half of tenosynovial "xanthomas" are in the fingers or at the metacarpophalangeal joints, while the locations next in frequency are the palms, wrists, toes, ankles, arms and legs.[13]

The cause and exact nature of pigmented villonodular synovitis and these related conditions are still unknown. Among the unproved theories is the concept that the process is a reactive inflammation of unknown origin.[1] Fisk[14] considered that the idiopathic syndrome of intermittent hydrathrosis is a precursor of pigmented villonodular synovitis. Equivocal evidence that the typical disease can be produced by injection of blood into joints has been presented.[15] Jaffe and co-workers[1] were unable to effect any appreciable permanent change in rabbits by this method. Bennett[16] has suggested that the reactive process of pigmented villonodular synovitis may represent a form of benign synovioma. Wright[17] stoutly maintained that the entire group of lesions already

---

Abridgment of thesis submitted by Dr. Atmore to the Faculty of the Graduate School of the University of Minnesota in partial fulfillment of the requirements for the degree of Master of Science in Orthopedic Surgery.

Dr. Atmore is from the Department of Orthopedic Surgery, Duluth Clinic, Duluth, Minnesota. Dr. Dahlin is from the Section of Surgical Pathology, and Dr. Ghormley is from the Section of Orthopedic Surgery, Mayo Clinic and Mayo Foundation, Rochester, Minn. The Mayo Foundation is a part of the Graduate School of the University of Minnesota.

mentioned is neoplastic, and he called them "benign giant-cell synoviomas."

Present Series

Our initial interest in pigmented villonodular synovitis was stimulated by the increased incidence of the disease at the Mayo Clinic in recent years. It was hoped that detailed study of the cases at the clinic might help to elucidate the cause of the condition and aid in determining whether a relationship exists between it and neoplastic disease of the synovium. It was elected to limit this study to pigmented villonodular synovitis as found in the joints and to two cases in which the process apparently was confined to popliteal bursae.

The cases in this series were obtained by examination of the pathologists' reports on all soft-tissue lesions of the lower extremity on file at the Mayo Clinic from January, 1920, to July, 1954. The review was limited to joints of the lower extremity because reports of articular pigmented villonodular synovitis above the hips could not be found in the literature. Any lesion reported to contain giant cells, iron pigment, foam cells or villous projections and involving a joint space was subjected to further study.

The gross specimens of any suggestive lesions, all of which were available for study, were then examined. New microscopic sections were prepared from various parts of all the specimens as indicated. A stain for iron was performed in each case.

Adding the cases gleaned from the files to the current cases, thirty-four examples of pigmented villonodular synovitis have been accumulated, including a recent typical diffuse lesion of the shoulder. The distribution is indicated in the table. The lesions in eighteen of the thirty-four cases were on the right side, sixteen being on the left. All thirty-two lesions involving joints were monarticular in nature.

The average age of all patients was 38.5 years. The age range in the patients who had diffuse articular disease was from sixteen to sixty years; six of these twenty-eight were included in each of the third, fourth and sixth decades of life and eight were found in the fifth decade. The ages of those who had focal lesions ranged from twenty to fifty-nine, and the two patients who had bursal disease were twenty-three and forty-six years of age, respectively.

TABLE I. PIGMENTED VILLONODULAR SYNOVITIS: DISTRIBUTION OF ARTICULAR LESIONS*

Location	Type of Lesion		
	Diffuse	Focal	Total Cases
Knee	20	3	23
Hip	5	1	6
Ankle	2	—	2
Shoulder	1	—	1
Total	28	4	32

*Excludes the two lesions confined to popliteal bursae.

The entire group showed a female sex preponderance of 23:11. In the patients with diffuse articular lesions, this ratio was 19:9.

Symptoms.—The average duration of symptoms before the patients came to the clinic was six and one-half years; the shortest period was six months and the longest was twenty-five years. Four patients had had surgical exploration elsewhere without definitive treatment. In two of these, popliteal bursae filled with pigmented villonodular lesions had been excised and similarly diseased knee joints with which they communicated had not been treated. Another, with no recognizable joint lesion, had undergone removal of the diseased popliteal bursa.

Pain was a complaint given by all thirty-four patients. The pain was severe and often incapacitating during periods of exacerbation of swelling, but generally it persisted as a dull ache between such episodes. Only four patients complained of pain in other than the involved joint. One of these had a punch biopsy of the opposite knee that revealed no pathologic changes, and another (the patient with the lesion of the shoulder) had a traumatic lesion of the other shoulder that explained the pain in the latter.

Swelling had not been noted by any of the patients who had lesions of the hip or shoulder. In contrast, all but one of those who had involvement of the knee or ankle mentioned this symptom, which had been noted at the onset of clinical symptoms in most instances. This swelling was intermittent and recurrent in fifteen patients, but progressive enlargement was present in twelve. Of the group with intermittent effusion, nine had undergone aspiration of the joint prior to treatment at the clinic. Three of these patients stated that the fluid had been hemorrhagic and two called it straw-colored.

Limitation of motion was a complaint in about half of this series. Three patients described recurrent "locking" of the involved joint.

Histories of trauma preceding the onset of symptoms were elicited from nearly half the patients.

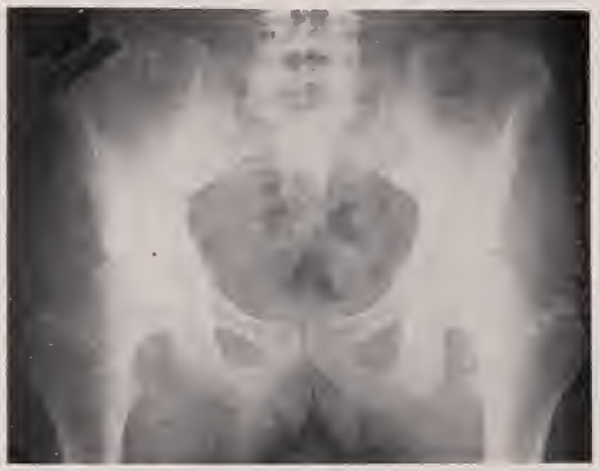
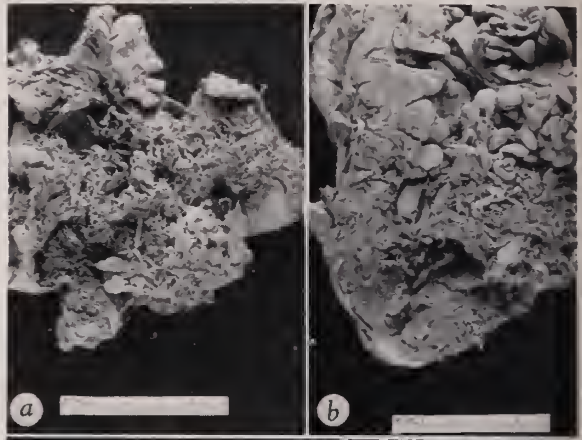


Fig. 1. Roentgenogram of the pelvis demonstrating cystic changes in the head of the femur and the acetabulum in pigmented villonodular synovitis of the right hip.

Examination.—Tenderness on palpation of the involved joint was present in half the patients. Limitation of motion, ordinarily minimal, but severe in a few, was recorded in twenty-one instances. Swelling of the affected joint was associated with all but one of the diffuse lesions of the knee or ankle; it was extremely prominent in several. This swelling was considered to be due to or associated with effusion in eleven patients. Focal masses in and about the joints were palpated in six patients. Enlargement of the suprapatellar pouch was observed commonly.

Roentgenographic examination gave positive results in two thirds of the diffuse lesions of the knee or ankle. Soft-tissue masses, sometimes nodular, were noted in thirteen of these twenty-two patients. Seven had cystlike rarefied foci measuring up to 2 cm. in diameter in the ends of the adjacent bones, two showed some irregularity of the bony cortex near the knee and one had only osteoporosis. All five patients with diffuse disease of the hip joint had cystic changes in their femoral heads and acetabula, along with other stigmas suggestive of degenerative joint disease of variable severity (Fig. 1). Two of the focal lesions of the knee produced soft-tissue masses visible roentgenographically, as did the lesion of the popliteal bursa that had not been excised.

Determinations of blood cholesterol, cholesterol esters, lecithin and fatty acids were done on five patients: all values were normal.



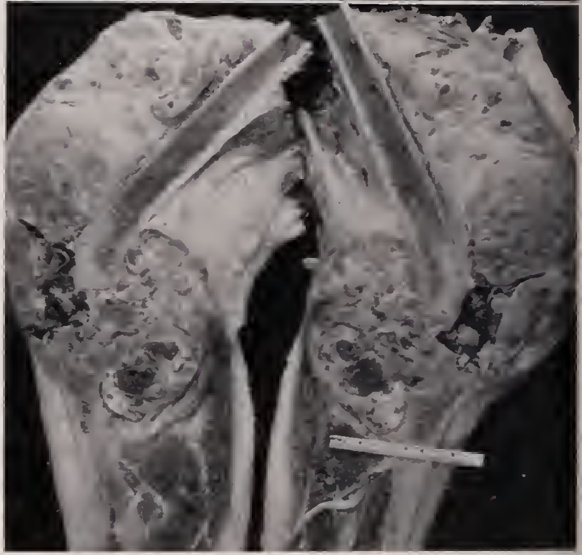


Fig. 2. *(above) (a)* Specimen from knee consisting mainly of shaggy villi, with minimal formation of nodules. *(b)* Lesion from knee demonstrating both villi and nodules.

Fig. 3. *(below)* Villonodular synovitis with pronounced tumefaction of the entire region of the knee joint, including the suprapatellar pouch. Because of severe destruction of the joint, amputation was considered the treatment of choice.

Gross Pathologic Appearance

A specimen obtained by punch biopsy through a trocar was the only tissue obtained from one patient. These brown shaggy fragments were accompanied by an excess of brown synovial fluid, such as was described in eleven of the surgically treated patients. Diffuse involvement of the joint in this patient was evident from the clinical features.

The pathologic process involved the synovium diffusely in twenty-seven of the patients treated surgically. The lesions in four patients were focal, with tan to dark-brown circumscribed masses varying from 2 to 13 cm. in diameter and projecting into the joint. Three of these focal tumors, unlike xanthomas of tendon sheaths, were spongelike, as though from partial fusion of villi. The largest lesion in this group filled a suprapatellar pouch. The uninvolved synovium in these patients appeared perfectly normal. The knee joint was the site of three focal tumors, and one was found in the hip.

The twenty-eight diffuse lesions included six in which there was extremely shaggy villous involvement, with only small nodules or none (Fig. 2*a*). The lesions in four of this group of twenty-eight patients were mainly nodular, with firm masses varying from 1 to 14 cm. in diameter and with thickening of the intervening synovium up to 2.5 cm. (Fig. 2*b*). The color varied from reddish brown to brownish black and many lesions had prominent yellow zones. The remaining lesions were both villous and nodular, with spongy regions of fused villi. Several of them contained small islands of normal-appearing synovium. One particularly remarkable specimen showed the entire region of the knee joint to be the site of a practically solid tumor measuring 30 by 20 by 20 cm. that had caused considerable destruction of the ends of the adjacent bones (Fig. 3). As already indicated, there were two instances in which popliteal bursae communicated with the knee joints and were affected by the same disease.

The other two lesions of the popliteal bursae showed diffuse villonodular disease similar to that noted in many of the articular lesions. In neither of these was there evidence of involvement of the knee joint itself.

Histopathologic Features

Microscopic study revealed a variety of characteristic changes. The most striking feature, in the average case, was hyperplasia of the synovial lining and stromal cells. This resulted in thickening of the lining layer and the production of thin or thick villous projections, with apparent penetration of these proliferating cells into the synovial connective tissue.

The villous projections ordinarily possessed cores of vascular connective tissue. These prominent synovial cells contained brownish pigment in every instance, although in some it was present in focal zones only. Special stains showed the brown pigment to be iron. Mitotic figures, present in every lesion and sometimes rather numerous. attested to the active proliferation of these cells. Occasional to fairly numerous multinucleated cells were found.

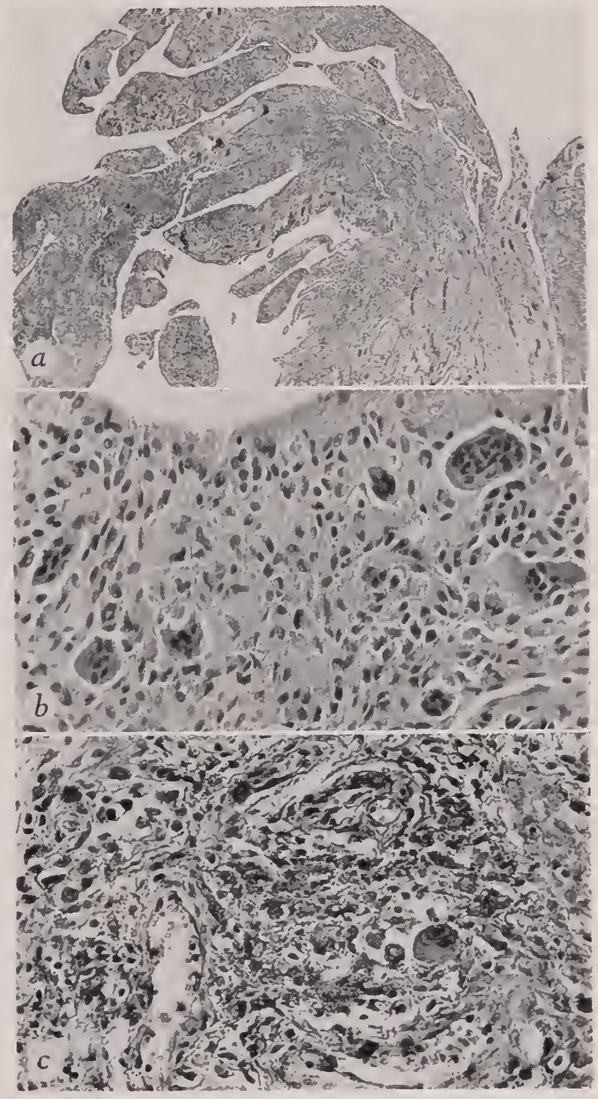


Fig. 4. *(a)* Villous formation and fusion of villi, with production of synovial-lined clefts (hematoxylin and eosin; x30). *(b)* Edge of a villous projection illustrating proliferating stromal and synovial cells and benign multinucleated cells (hematoxylin and eosin; x300). *(c)* Mass of synovial cells that are granular owing to the presence of hemosiderin (hematoxylin and eosin; x300).

As the lesions progressed in severity, fusion of these villous projections occurred, often producing prominent clefts lined by synovial cells (Fig. 4*a*). These clefts were present in every case and, when extensive, were the histologic counterpart of the spongy regions observed grossly. Solid zones with few or no residual clefts were seen in what appeared to be still older portions. These solid nodules were indistinguishable grossly or microscopically from xanthomas (benign synoviomas) of tendon sheaths. Their histologic components were proliferating synovial cells, benign multinucleated cells and cells containing variable amounts of iron or lipides, with occasional large hyalinized areas.

Lipides within isolated cells or sheets of cells were found in every lesion. When extensive, their presence produced grossly yellow zones. These lipide-containing cells were found commonly in the deeper portions of the synovial connective tissue. It was frequently impossible to decide whether the lipide-laden foam cells were basically synovial lining cells or histiocytic elements. Sheets of foam cells constituted a fourth or more of the histologic material studied in 75 per cent of the cases.

Multinucleated benign giant cells were present in every specimen (Fig. 4*b*). These ordinarily contained from eight to ten or more nuclei. They were found in both villous and nodular zones.

Iron pigment within cells also was found in every case (Fig. 4*c*). It was impossible at times to decide that the hemosiderin-containing cells were not histiocytes. To check the concept that extensive pigmentation is a feature of older lesions, the amount of iron found was correlated with the preoperative duration of symptoms. It was found that patients with extensive deposits of iron had experienced symptoms for an average of eight years, as opposed to an average of four years for those with less iron.

Cells usually associated with inflammatory changes were conspicuous by their paucity in these lesions. Occasional lymphocytes were seen in some areas. In only one instance were there focal and diffuse collections of lymphocytes to a degree comparable to that seen in rheumatoid synovitis.

Material from the adjacent cystic defects in the bones of a nearby joint was available for study in several cases. In none of these was the tissue from this source like the synovial lesion; rather, it consisted merely of myxomatous fibrous tissue of the type obtained from similar cysts in ordinary degenerative disease of joints. Furthermore, some of the cysts had no obvious communication with the joint space.

Treatment and Results

All four of the patients with focal lesions and one of the patients with a lesion of the popliteal bursa have remained well for periods varying from eight to thirty-four years after surgical excision. The other diseased popliteal bursa was removed one year ago.

The five patients who had diffuse lesions of the hip were treated by removal of as much of the diseased synovium as possible, followed by insertion of vitallium cups. Three had adjunctive roentgen therapy. These five were treated rather recently and have been followed for periods varying from six months to three and one-half years. Three have had good results, whereas two have considerable limp. These follow-up periods are, of course, inadequate for final appraisal. To date, there is no appreciable difference in results between the irradiated and the nonirradiated patients.

Eighteen of the patients who had diffuse lesions of the knee joint were treated with subtotal synovectomy, which consisted of removal of as much of the synovium as was deemed surgically feasible. Follow-up information for more than two years is available in only ten of these. Half of the ten had irradiation therapy in addition to excision. No significant differences are apparent in the long-term results from the two forms of treatment in these small groups. Recurrence has been proved in three of the ten patients and several others have some stiffness.

Results in the two patients who had diffuse lesions of the ankle likewise shed little light on the problem of correct management. One had subtotal removal and roentgen therapy that was repeated a year later because of persistent disease; he then was lost to follow-up. The other had excision of the bulk of the diseased tissue, followed by two courses of radium treatment. He received roentgen therapy three years later after excision of a recurrent lesion. Although the progress of the disease was arrested, amputation became necessary seven years after the second operation because of damage from the irradiation.

The lesion in the shoulder was recently excised, along with repair of a torn musculotendinous shoulder cuff. Apparently, it was merely an incidental finding despite its typical gross and microscopic features. The result was good eight months after operation.

Comment

The pronounced predilection displayed by pigmented villonodular synovitis for the lower exremities, especially the knee joint, was further emphasized by this study. As already indicated, however, a typical example of this disease was discovered just prior to completion of this review, as an incidental finding in the shoulder of a patient. Thorough perusal of the files on lesions of the upper extremity possibly might uncover more cases. We were unable to discover why this esion generally is limited to the lower extremity. Trauma was noted by nearly half the patients but, inasmuch as a history of notable injury generally is obtained readily in disease of the joints and extremities, it appears that trauma was an ncidental episode in these instances.

Sections of synovium taken from three knee oints containing hemorrhagic fluid after trauma were seen in the course of this study. The synovium in these instances contained hemosiderin n the lining cells and underlying histiocytes but ailed to show any of the other features of pigmented villonodular synovitis. This series lent no positive support to the view that the disease is caused by intra-articular hemorrhage. Furthermore, none of these patients gave evidence of any blood dyscrasia. It has been shown that hemochromatosis gives brownish pigmentation of he synovial lining not associated with the other eatures of pigmented villonodular synovitis.[18]

As indicated before, Fisk[14] mentioned the possibility of so-called idiopathic intermittent hydrarhrosis as a precursor of pigmented villonodular ynovitis. One third of our patients gave a hisory of recurrent effusion in the involved joint prior to operation, but it is impossible to determine any cause-and-effect relationship.

Some investigators have considered rheumatoid arthritis to be a precursor of pigmented villonodular synovitis. One of our patients had an inflammatory component suggestive of rheumatoid synovitis but, with this single exception, the study indicated no transition between these two diseases. Because the cases were selected for study on the basis of suggestive pathologic reports on file, numerous villous rheumatoid synovial membranes were studied. It appears unlikely that transitional phases between these two entities could have been overlooked if they occur.

The impression gained from the literature is that disordered metabolism of fat plays no significant role in this disease. Only five of the patients in this series had determinations of blood lipides, all of which were normal..

The question of whether pigmented villonodular synovitis represents a peculiar type of synovial neoplasm is as yet unanswered. Features suggesting that the lesion may be neoplastic include the following: In each of these patients, the disease was progressive until treatment was instituted. The nodules formed are identical to xanthomas of tendon sheaths, which some observers consider to be benign synoviomas. The large size that may be attained by these lesions in the absence of a significant inflammatory component is difficult to explain on a non-neoplastic basis. Furthermore, no infectious agent has been implicated.

Lewis[19] has listed criteria for the roentgenologic diagnosis of pigmented villonodular synovitis. These include (1) bones of a young adult, (2) monarticular involvement, (3) an excessive amount of synovitis, which may appear smooth in outline but which is particularly diagnostic when it is, in part at least, nodular in outline and density, (4) no indication of abnormalities of cartilage and (5) completely normal-appearing bones. This last criterion is frequently invalid, as evidenced by the number of lesions in this series in which cystic defects adjacent to the joints were seen. In fact, such cysts were observed in all the patients who had diffuse disease of the hip joint.

Aspiration of synovium for biopsy confirmed the diagnosis of pigmented villonodular synovitis in four cases in this series. These specimens were procured by the technique for punch biopsy described by Polley and Bickel.[20] In patients in whom the disease is focal and even in some of those with diffuse involvement, a specimen procured blindly through a trocar could fail to give unequivocal histologic proof of this disease; however, a diagnostic specimen should be obtained in most of the diffuse lesions of knee joints.

Histologic studies in this series revealed no new features. None of the lesions underwent malignant transformation. Mitotic activity may be prominent in parts of these lesions but an erroneous diagnosis of a malignant lesion, such as synovial sarcoma, can be avoided readily. The combination of iron-containing cells, lipide-containing cells and benign multinucleated cells labels this condition benign as accurately as it does in the case of xanthomas of tendon sheaths.

The two examples of pigmented villonodular bursitis re-emphasize the fact that this peculiar lesion can occur apart from joints.

The best treatment of diffuse pigmented villonodular synovitis is still debatable. Synovectomy frequently gives prolonged benefit but recurrence is not uncommon; recurrent lesions appeared after five years in two of our patients. Roentgen therapy has been advocated by some workers.[12,19] Our observations certainly do not justify a dogmatic stand but we are of the opinion that as complete surgical extirpation as possible should be attempted. Postoperative irradiation therapy may be advisable, especially in the management of recurrent lesions. Since no lesion in this series nor in the literature has pursued a malignant course, treatment is never an emergency procedure.

Summary and Conclusions

A series of thirty-four cases of pigmented villonodular synovitis has been studied at the Mayo Clinic.

Pigmented villonodular synovitis is a relatively rare disorder of unknown cause and nature. Without completely settling the issue, this study lends support to the theory that the lesion is neoplastic or at least can assume the proportions of a neoplasm.

These observations emphasize the histologic kinship of the diffuse and focal synovial lesions, as well as pigmented villonodular bursitis and "xanthomas," or "benign synoviomas," of tendon sheaths.

Study of this series and of reported cases indicates that further evaluation and follow-up data are necessary to determine the best treatment or combination of treatments for the diffuse form of pigmented villonodular synovitis.

References

1. Jaffe, H. L.; Lichtenstein, Louis, and Sutro, C. J.: Pigmented villonodular synovitis, bursitis and tenosynovitis: a discussion of the synovial and bursal equivalents of the tenosynovial lesion commonly denoted as xanthoma, xanthogranuloma, gia cell tumor or myeloplaxoma of the tendon sheat with some consideration of this tendon sheath lesio itself. Arch. Path., 31:731-765 (June) 1941.
2. Galloway, J. D. B.; Broders, A. C., and Ghormle R. K.: Xanthoma of tendon sheaths and synovi membranes: a clinical and pathologic study. Arc Surg., 40:485-538 (Mar.) 1940.
3. Shafer, S. J., and Larmon, W. A.: Pigmented vill nodular synovitis: report of seven cases. Surg Gynec. & Obst., 92:574-580 (May) 1951.
4. Spencer, H., and Whimster, I. W.: The develo ment of giant-celled tendon-sheath tumours an related conditions (chronic villo-nodular synovit and cutaneous histiocytoma). J. Path. & Bact., 62 411-418 (July) 1950.
5. Weisser, J. R., and Robinson, D. W.: Pigmente villonodular synovitis of iliopectineal bursa: a cas report. J. Bone & Joint Surg., 33-A:988-992 (Oct. 1951.
6. Carr, C. R., and Davis, W. C.: Pigmented vill nodular synovitis of the hip joint: a case repor J. Bone & Joint Surg., 36-A:1007-1013 (Oct. 1954.
7. Case Records of the Massachusetts General Hosp tal: Case 37292: Presentation of case. New Eng land J. Med., 245:112-115 (July 19) 1951.
8. Case Records of the Massachusetts General Hos pital: Case 30131: Presentation of case. Ne England J. Med., 230:409-412 (Mar. 30) 194
9. Ghormley, R. K., and Romness, J. O.: Pigmente villonodular synovitis (xanthomatosis) of the hi joint. Proc. Staff Meet., Mayo Clin., 29:171-18 (Mar. 24) 1954.
10. De Santo, D. A., and Wilson, P. D.: Xanthoma tous tumors of joints. J. Bone & Joint Surg., n. 21:531-558 (July) 1939.
11. Minear, W. L.: Xanthomatous joint tumors. J Bone & Joint Surg., 33-A:451-458 (Apr.) 1951.
12. Greenfield, M. M., and Wallace, K. M.: Pig mented villonodular synovitis. Radiology, 54:35 356 (Mar.) 1950.
13. Charache, Herman: Tumors of tendon sheath Arch. Surg., 44:1038-1052 (June) 1942.
14. Fisk, G. R.: Hyperplasia and metaplasia in syn ovial membrane. Ann. Roy. Coll. Surgeons Eng land, 11:157-171, 1952.
15. Young, J. M., and Hudacek, A. G.: Experimenta production of pigmented villonodular synovitis i dogs. Am. J. Path., 30:799-811 (July-Aug.) 1954
16. Bennett, G. A.: Reactive and neoplastic change in synovial tissues. Proc. Inst. Med. Chicago, 18 26-37 (Feb. 15) 1950.
17. Wright, C. J. E.: Benign giant-cell synovioma an investigation of 85 cases. Brit. J. Surg., 38 257-271 (Jan.) 1951.
18. Collins, D. H.: Haemosiderosis and haemochr matosis of synovial tissues. J. Bone & Joint Surg 33-B:436-441 (Aug.) 1951.
19. Lewis, R. W.: Roentgen diagnosis of pigmente villonodular synovitis and synovial sarcoma of th knee joint: preliminary report. Radiology, 49:2 37 (July) 1947.
20. Polley, H. F., and Bickel, W. H.: Experiences wit an instrument for punch biopsy of synovial me brane. Proc. Staff Meet., Mayo Clin., 26:273-28 (July 18) 1951.

Present Concept of the Treatment of Arteriosclerosis Obliterans

J. EARLE ESTES, JR., M.D.
Rochester, Minnesota

ARTERIOSCLEROSIS obliterans is a term used to designate a chronic occlusive arterial disease of the extremities occurring as a maniestation of atherosclerosis. The syndrome of areriosclerosis obliterans becomes manifest as a reult of ischemia of tissues owing to interference with the flow of blood through the main peripheral arteries. The treatment of this syndrome is complex because of its numerous clinical manifestaions and the lack of knowledge concerning its ause. The principles of therapy might be stated hus: (1) arrest the progress of the disease, (2) ttempt to increase blood flow in the ischemic issues and (3) provide symptomatic relief.

Arrest Progress of Disease

To arrest the progress of arteriosclerosis obliterans would require knowledge as to the cause of atherosclerosis. At present, knowledge of this is oo incomplete to provide an exact therapeutic regimen. Because of the obvious implication of abnormal metabolism of fat in the development of atherosclerosis, several therapeutic measures have been aimed at correction of this defect. These include, either singly or in combination, the provision of a diet low in fat content and the administration of lipotropic substances (inositol, holine), estrogens, thyroid extract, heparin, or odine, to mention only a few. To summarize this omplicated problem briefly, it is my opinion that here is no treatment that has been demonstrated o have a consistent effect in arresting the progress of atherosclerosis. One should discuss briefly and imply with patients afflicted with arteriosclerosis obliterans (and particularly when it is associated with hyperlipemia) the apparent relationship of at metabolism and atherosclerosis. Thus, the patient may participate in any decision as to treatment with a diet low in fat content or with drugs.

It has been shown conclusively that the quantity of nicotine in a cigaret produces vasoconstriction of the arteries supplying the skin and thereby results in decrease of blood flow and skin temperature. This vasoconstriction is likely to be harmful in ischemic extremities. Ordinarily, I urge patients with severe ischemia to discontinue the use of tobacco. However, in patients with only mild ischemia I merely discuss the role of tobacco in further decreasing their circulation, emphasize the medical reasons for discontinuing the use of tobacco and leave the decision on the use of tobacco to the patient. One must utilize a certain philosophic approach to this problem, for many times the complete discontinuance of the use of tobacco represents a hardship and loss of pleasure to an elderly person with minimal if any resultant medical benefit.

Control of trichophytosis is important, because this condition frequently causes interdigital fissures which may lead to cellulitis and gangrene. Ordinarily, soaking the feet in a 1:9,000 solution of potassium permanganate for 15 minutes twice daily is successful in eradicating trichophytosis in 5 to 10 days. After this has been accomplished, it is wise to suggest the daily use of a foot powder such as zincundecate (desenex) as a prophylactic measure.

Appropriate control of diabetes, when present, is important, for this measure aids indirectly in the healing of ulcers and in maintaining resistance to local infections.

Theoretically, long-term use of anticoagulant drugs should be beneficial in preventing the thrombosis of chronic occlusive arterial diseases. However, this treatment usually is not practicable because of the risk of hemorrhage, the need for adequate laboratory control of prothrombin time, the cost to the patient and the need for treatment to be continued over many months or years.

From the Section of Medicine, Mayo Clinic and Mayo Foundation, Rochester, Minnesota.

The Mayo Foundation, Rochester, Minnesota, is a part of the Graduate School of the University of Minesota.

Attempt to Increase Blood Flow

Attempts to increase blood flow in ischemic extremities have been numerous and varied in type. My colleagues and I have not found postural exercises and the use of suction or pressure apparatuses sufficiently beneficial to warrant their use. The Sanders oscillating bed seems moderately helpful in increasing blood flow to the feet, relieving ischemic neuritis and inducing sleep. However, the use of such a bed is ordinarily confined to a hospital, although a few of our patients have purchased one for home use.

A warm environmental temperature is helpful in producing vasodilatation of the skin. Vasodilatation may be obtained by keeping the temperature of the patient's room between 85° and 90° F. My colleagues and I have also used a wooden box, placed at the foot of the bed, into which are placed the patient's lower extremities. The temperature in this box is kept thermostatically between 85° and 90° F. Contrast baths have been used in the past, but I prefer not to use these because of the possibility of trauma from excessive heat or cold. Also, whatever vasodilatation is produced by contrast baths is very transient.

One to two ounces of alcohol given three or four times a day produces transient vasodilatation, some sedative effect and mild euphoria. It should be remembered, however, that the effect is transient and that some people cannot tolerate alcohol. I hesitate to advise the regular use of alcohol over a period of weeks or months for fear of inducing a state of chronic alcoholism. At times, alcohol may be given intravenously as a 5 per cent solution, the rate of infusion being regulated by the effect on the patient.

"Vasodilating" drugs such as 3-pyridinemethanol (roniacol), benzazoline (priscoline), hydrogenated ergot alkaloids (hydergine), hexamethonium bromide (bistrium) and pentolinium tartrate (ansolysen), for example, have been advocated for the treatment of arteriosclerosis obliterans. Our experience has been that "vasodilating" drugs have not been significantly effective in increasing arterial blood flow in extremities that are ischemic owing to arteriosclerosis obliterans. Theoretically, the effectiveness of such drugs depends upon the capacity of the peripheral arteries to dilate. If a prominent vasospastic element is present, such drugs may be partially beneficial in reducing vasospasm, but this situation rarely is a significant factor in arteriosclerosis obliterans.

Lumbar sympathectomy is used at times in arteriosclerosis obliterans to increase the flow of blood through the skin. Such an increase occurs as a result of vasodilatation of the small arteries that supply the skin. Lumbar sympathectomy provides maximal "permanent" vasodilatation. It does not arrest the disease process that is causing arterial occlusion, nor does it open arteries that are organically occluded.

A bilateral, abdominal, extraperitoneal approach may be used in which some or all of the first four lumbar ganglia are excised. Ordinarily, the second and third lumbar ganglia are the ones excised, but if the first and fourth are visible in the incision they also are removed. When both second lumbar ganglia are removed, approximately half of the men so treated will be sterile. This occurs as a result of loss of ejaculatory power. Some of the men so affected regain the power of ejaculation after several weeks or months. Whether unilateral or bilateral lumbar sympathectomy is performed depends upon whether the occlusive arterial disease is unilateral or bilateral. Also, in some instances in which it is desirable to avoid sterility, unilateral lumbar sympathectomy is advisable.

There are no exact criteria for selection of patients for lumbar sympathectomy. In general, persons who are less than 60 to 65 years of age (and that is more or less an arbitrary figure), who have little or no gangrene and who seem clinically to have the potential for vasodilatation may be considered to be suitable candidates for the operation. One aid in selection of patients is to determine whether the skin temperature of the toes can be increased under conditions of vasodilatation. The vasodilatation is preferably induced by a room environmental temperature of 90° F., but may also be induced by ingestion of alcohol or by a lumbar sympathetic block with piperocaine (metycaine).

In general, neurosurgeons perform lumbar sympathectomy more often in younger than in older patients, in those without gangrene (unless very minor) and in those in whom the capacity for vasodilatation can be demonstrated. My colleagues and I do not advise sympathectomy in the presence of extensive ulcerations or gangrene in which amputation is likely to be necessary. Sympathectomy in such circumstances is ordinarily a needless operation.

In recent years, surgeons have attempted to produce chemical sympathectomy by injecting the lumbar ganglia with absolute alcohol. We do not feel that this procedure is adequate replacement for surgical excision of ganglia, because the effect is inconstant and transient in some instances. However, chemical sympathectomy may be used when surgical sympathectomy is not advisable, as in advanced age or in the presence of a disease that makes the surgical risk excessive.

Improved surgical techniques have led to attempts at improving blood flow to ischemic limbs by means of blood-vessel grafts. Initially, simple resection of the diseased segment of artery was performed. Some patients have demonstrated return of pulsations in the foot and decrease in severity of symptoms following such treatment. However, this form of therapy has not been uniformly successful. Resection of the diseased arterial segment in conjunction with placement of a vessel graft to replace the diseased segment and to provide continuity of the vessel has also been attempted. Types of grafts include homografts with vein or artery, and prosthetic grafts of nylon, orlon or ivalon. Vein grafts seem to be the least desirable because of a tendency to rupture or aneurysm formation. It is too early to evaluate completely arterial or prosthetic grafts but experience with both of these has been very encouraging. The beneficial results of grafting include restoration of the continuity of major vessels and pulsatile blood flow plus relief of symptoms. Most of these grafts remain patent and have not been associated with hemorrhage or aneurysm formation. This new surgical approach to the treatment of *segmental* arterial occlusion seems to represent a major advance in the treatment of arteriosclerosis obliterans. However, final evaluation of its efficacy must await statistical study of such surgically treated patients over a period of several years.

Relieve Symptoms

Symptomatic treatment of patients with arteriosclerosis obliterans requires the use of diverse therapeutic agents. A deproteinated extract of pancreatic tissue (depropanex) has been used in the treatment of claudication. Roughly, 50 per cent of patients treated with this substance feel that they obtain some improvement. Objective proof of this is lacking. This form of therapy may be justifiable occasionally, although I personally doubt its effectiveness. The dosage is empiric—5 cc. given intramuscularly each day for one week and then 5 cc. given intramuscularly three times a week for two weeks, two times a week for two weeks and once a week for two weeks. If the patient considers that claudication is decreased, the entire course may be repeated after a six-week interval.

Other drugs that have been used for claudication are curare, mephenesin (tolserol), heparin, testosterone and nicotinic acid, but they have been of no significant benefit in our experience. Achilles tenotomy has been advocated for relief of claudication, but this has not been universally accepted. Bilateral tenotomy results in a shuffling gait and requires re-education in walking.

Relief of pain of ischemic neuropathy may be difficult. One should use the simplest drugs first, such as barbiturates, aspirin and codeine. Often, however, it becomes necessary to use opiates such as morphine or meperidine (demerol). Physicians must be extremely cautious to avoid addiction in such patients. Rarely, in cases in which it is not possible to relieve a severe, chronic ischemic pain amputation is justifiable.

The rôle of trauma in the causation of ulceration and gangrene cannot be overemphasized, and patients with ischemic extremities must be instructed as to the care of their feet. They should be cautioned to wear well-fitting hose and shoes, and to avoid all forms of trauma (thermal, chemical, cutting, bruising and so forth). Corns and calluses should be cared for by a physician or a well-trained chiropodist who is aware of the problem of ischemic feet. Toenails should be cut squarely and ingrown nails treated by a physician or chiropodist. Fungous infections must be controlled.

Ulceration and gangrene require rest in bed. The area to be treated may be cleansed by using wet boric acid packs continuously. A 0.5 per cent solution of aluminum subacetate is helpful for pruritic lesions. Dilute acetic acid is particularly beneficial in ulcers infected by Pseudomonas organisms. Wet tyrothricin packs are also helpful in some instances in which the infection of the ulcer is resistant to other measures.

(Continued on Page 207)

Suction Drainage for the Prevention of Dead Space in Surgical Wounds

S. R. MAXEINER, JR., M.D., and
STANLEY R. MAXEINER, M.D.
Minneapolis, Minnesota

FUNDAMENTAL surgical principles indict dead space as an obstacle to healing. Accordingly, surgeons have made special efforts to prevent serosanguinous accumulations consequent to the leaving of unfilled spaces in the depths of wounds. The thoracic surgeon knows that the best prevention of empyema after thoracotomy is full expansion of the lung to fill the chest. The plastic surgeon lays as much emphasis on a good pressure dressing as on the surgical procedure proper. He soon becomes fully aware of the frequent difficulty in keeping the pressure uniformly and accurately applied despite irregular contours and motion. The general surgeon has frequent occasion to create extensive wounds which have potential spaces for the accumulation of blood and exudate. Of especial note are the operations of radical mastectomy, block dissection of the neck, radical inguinal dissection, and ventral hernioplasty. Extensive flaps are elevated and finally replaced over raw surfaces which may ooze both blood and lymph. Should the potential space become filled with these fluids, infection and delayed healing are to be expected; prevention of such accumulation, although difficult, is the only road to primary healing. The purpose of this paper is to call attention to a simple technique to accomplish this end.

The principles of the procedure are to provide active external siphonage of fluid accumulations and to substitute atmospheric pressure for pressure dressings. All that need be done is to make the wound airtight and to drain the potential dead space under the flaps into a system having a pressure less than atmospheric.

After operative dissection, hemostasis, and repair in the usual fashion, a tiny stab wound is made at an appropriate point in the skin. Through it is passed a tight-fitting catheter having multiple perforations in its distal end. The catheter is placed under the flap in position to be maximally effective in the removal of fluid and air. One or more catheters may be used. The wound is now closed in the usual manner by any simple stitch. The closure of the space under the flaps should now be airtight. The wound is dressed lightly with collodion or aeroplast in order further to prevent leakage of air. The catheter or catheters are connected to sterile suction apparatus; a negative pressure of about five pounds per square inch is applied. At once the air and fluid under the flaps will be extracted; the flaps will be seen closely to conform to the underlying tissues, however irregular they may be. Suction is continued either by an electric pump or by the Wangensteen apparatus for a period of forty-eight to ninety-six hours. After this period of time, the returns will be minimal, the flaps will be adherent to their subvirons, and the catheter will be plugged with fibrin. At this time it can be removed.

A light dressing is now desirable until healing is completed. We have found that such dressings after radical mastectomy can be easily and comfortably held in place, without adhesive, by the wearing of a Muller chest binder.

We have been eminently satisfied with this technique after radical mastectomy. The bulky and expensive pressure dressing is entirely done away with, along with its odor. Flaps become promptly and securely attached to underlying tissues, even in the apex of the axilla. Healing is improved. Arm motion is regained earlier and more easily. Patients are ready to leave the hospital three to five days sooner than with prior techniques. We have had two patients subjected to a second radical mastectomy; both patients vastly preferred the suction technique.

There have been no ill effects noted from the application of negative pressure to wounds. Circulation has not been interfered with. Infection has been no problem.

The idea of suction-drainage is not original with us. In 1952, Raffl[5] described, after radical mastectomy, the use of a catheter passing from the potential dead space to a suction device. Koontz[4] used and described a similar technique in extensive ventral hernioplasty. The present authors became aware of the technique as it was employed at the U. S. Naval Hospital, Oakland, California, with very successful results, by Capt. Richard S. Silvis, U.S.N. Other favorable experiences have been reported.[1,2,3,7]

It should be specifically pointed out that these techniques differ from the simple application of suction to a drainage tube, especially a sump drain or a drain supplied with an air vent. In suction-drainage, the wound is made airtight. Because of the negative pressure thus created, complete removal of fluid drainage is secured; formation of further fluid is minimized by the uniform pressure of the atmosphere on the flaps; and primary healing of the approximated surfaces of tissue is promoted.

Summary

On the basis of our experience to date, we feel that suction-drainage of an airtight wound is the definitive technique for obliterating dead spaces in extensive surgical wounds.

References

1. Cassie, Gordon F.: Negative-pressure drainage in radical mastectomy. Brit. M. J., 4885-452 (Aug. 21) 1954.
2. Connolly, John E.: Prevention of postoperative subcutaneous fluid collection by suction. J.A.M.A., 157:1490-1491 (April 23) 1955.
3. Jenson, James: Negative pressure drainage in radical mastectomy. Brit. M. J., 646, (Sept. 11) 1954.
4. Lattimore, Thomas J., and Koontz, Amos R.: Suction drainage after implantation of tantalum gauze sheets. J.A.M.A., 155:1333- 1334, (Aug. 7) 1954.
5. Raffl, Arthur B.: The use of negative pressure under skin flaps after radical mastectomy. Am. Surg., 136:1048 (Dec.) 1952.
6. Silvis, Richard S.: Ann. Surg., 142:252-256 (Aug.) 1955.
7. Smith, Carey C. K.: Negative pressure drainage in radical mastectomy. Brit. M. J., 811, (Oct. 2) 1954.

PRESENT CONCEPT OF THE TREATMENT OF ARTERIOSCLEROSIS OBLITERANS

(Continued from Page 205)

It is suggested that the simplest measures be tried first. Application of any substance that might cause chemical necrosis is to be avoided. When the base of the ulcer is clean, a powder of dried erythrocytes may be sprinkled over the ulcer. After three to seven days, this may be soaked off and new powder applied. We have found this to be quite beneficial in some instances.

The use of a combination of streptokinase and streptodornase (varidase) has been found recently to be successful in producing a clean base of granulation tissue. The parenteral or oral administration of antibiotic drugs is frequently indicated for control of infection in the tissues surrounding the ulcer or the site of gangrene.

When therapeutic measures fail to heal the ulcer, amputation may become necessary. Before resorting to this, all conservative measures should be tried, if there seems to be a reasonable chance for healing to occur. Amputation of a gangrenous toe with subsequent healing of the amputation site is rarely possible in arteriosclerosis obliterans because of the severity of ischemia in this disease. The site of amputation (either "below knee" or "midthigh") is determined by the level of the extremity at which circulation is sufficient to permit healing of the stump. Many tests have been devised to localize such levels, but usually the surgeon can tell best at the time of operation by the amount of bleeding present. For example, if there is minimal bleeding in a below-knee approach, the surgeon may feel it necessary to do a midthigh amputation.

It is obvious from the above discussion that current therapeutic measures for arteriosclerosis obliterans are inadequate. The essence of the problem is that of the etiology of atherosclerosis. For when we learn to prevent atherosclerosis, its ischemic manifestations (arteriosclerosis obliterans) will no longer occur.

Minnesota Rheumatic Fever Survey, 1955

D. S. FLEMING, M.D., M.P.H.
F. J. HIRSCHBOECK, M.D.
J. A. COSGRIFF, M.D.

THE Minnesota rheumatic fever survey originated in 1953 when the Heart Committee of the Minnesota State Medical Association appointed a small group to prepare a brief questionnaire with the intention of learning from practicing physicians throughout the state how much of a problem rheumatic fever represented. The Minnesota Heart Association and the state health department participated in the project from its onset.

TABLE I. CASES OF RHEUMATIC FEVER REPORTED TO MINNESOTA DEPARTMENT OF HEALTH, 1944-1954

Year	Number of Cases
1944	0
1945	15
1946	82
1947	144
1948	120
1949	131
1950	162
1951	170
1952	221
1953	235
1954	148

Reasons for such a survey lay in the need for current information on rheumatic fever. In recent years a growing feeling has developed that rheumatic fever has been declining in incidence and prevalence and that the disease no longer is a serious problem. At the same time, newer methods of prevention and treatment have rapidly developed, deserving widespread adoption if the disease continues to be widespread. Because accurate current information as to the prevalence of the disease has been lacking, the Heart Committee undertook a statewide survey to provide some of this data.

In Table I is shown the number of cases of rheumatic fever reported to the state health department in Minnesota in the years since 1944 when the disease was made reportable. The cases reported in 1954 and 1953 are shown by age grouping and sex in Table II. Fifty-four per cent of the cases were in males. Of the 233 cases where age is given, 117 (50.2 per cent) were under the age of fifteen years. In these two years, 1953 and 1954, reported cases from fifty of the state's eighty-seven counties were recorded.

TABLE II. CASES OF RHEUMATIC FEVER REPORTED TO MINNESOTA DEPARTMENT OF HEALTH, 1953, 1954, BY SEX AND AGE GROUP

Age	1953			1954		
	Male	Female	Total	Male	Female	Total
Under 1						
1						
2	1	1	2			
3		3	3	2		2
4	1	3	4			
5- 9	19	17	36	10	12	22
10-14	16	19	35	8	5	13
15-19	10	9	19	3	6	9
20-24	4	2	6	4		4
25-29	9	3	12	2		2
30-34	6	3	9	10	2	12
35-39	6	3	9	2	2	4
40-44	3		3	5	1	6
45-49	3		3		2	2
50-54	3	1	4	2		2
55-59			0		1	1
60-64	2		2		2	2
65 & over		1	1	1	3	4
Not stated	41	46	87	35	28	63
Total	124	111	235	84	64	148

The plan of the survey was to send to every physician in the state a simple questionnaire for his completion and return in a stamped return address envelope (see reproduction of questionnaire). Negative replies were indicated as important as positive replies. A letter explaining the survey and type of data requested accompanied the questionnaire. The definition of a case of rheumatic fever for purposes of counting in the survey was the responsibility of each physician to decide. The survey was directed at rheumatic fever as the doctors working diagnosis, and was not limited to rheumatic heart disease.

The questionnaire and explanatory letter were sent on September 9, 1955, to all physicians whose names and addresses were currently available to the Minnesota State Medical Association as members of the association; this group included 200 life members and totaled 3,063 physicians. This

---

Dr. Fleming is director, Division of Disease Prevention and Control, Minnesota Department of Health. Dr. Hirschboeck is chairman, Heart Committee, Minnesota State Medical Association. Dr. Cosgriff is president, Minnesota Heart Association.

To: Members of the Minnesota State
Medical Association

Dear Doctor:

The Heart Committee and the Council of the Minnesota State Medical Association asks your co-operation in a statewide survey of the present-day problem of rheumatic fever. We want you to tell us, on the enclosed simple questionnaire, how extensive a problem this disease is to you in your own practice, so that we will have a better foundation for approaching it on a statewide basis.

Rheumatic fever is reportable to the State Board of Health in Minnesota but because of difficulty in defining what is a reportable case, such figures over the years are neither complete nor entirely accurate. Even so, 235 cases were reported in 1953, and 150 cases in 1954. There is an impression that rheumatic fever is declining and is not a serious problem in Minnesota, but we need more complete information before we can accept this.

For the purposes of this questionnaire we leave the definition of active rheumatic fever up to you as a physician. If you are treating someone for this diagnosis, please count it for your entry to query 1. The data should include all cases under your care in the previous twelve-month period. We did not intend, however, that this entry would include patients being treated only for decompensation, resulting from rheumatic heart disease of the past. If the rheumatic fever is still an active part of the condition, however, such a case should be counted. You can see the problem of definition.

In query 3, as to kind of prophylaxis, we had in mind whether you employ some of the following measures:

Continuous prophylaxis for some patients.

Intermittent prophylaxis for some patients, by special treatment of acute attacks of streptococcal disease.

Special provisions of prophylaxis for patients admitted to hospital where there may be increased hazards from streptococcal contacts.

Oral prophylaxis.

Intramuscular prophylaxis.

Type of drug employed, such as sulfonamide, penicillin, broad spectrum antibiotics, other.

Several of these entries could all be included in answering query 3.

Please fill in the questionnaire now and return it to us in the enclosed stamped return addressed envelopes. If you have no patients in any of the categories listed, please tell us that, too. Negative answers are just as important to us as positive. Thank you very much for your prompt co-operation.

F. J. Hirschboeck, M.D.
Chairman, Heart Committee
James A. Cosgriff, M.D.
President, Minnesota Heart Association
John F. Briggs, M.D.
Member, Minnesota State Medical Association

QUESTIONNAIRE FOR RHEUMATIC FEVER SURVEY

(Date) ....

To: All Physicians in Minnesota

Please complete the following queries and return this sheet to the Minnesota State Medical Association in the attached return address envelope.

1. How many patients in your practice are you now treating for active rheumatic fever in the past twelve months?
2. How many patients are under 15 years?
3. How many individuals in your practice are you now giving some form of prophylaxis to, to prevent the development of rheumatic fever? ....
4. What kind of prophylaxis are you using?...............

....

(Signed) ...., M.D.

Address ....

County ....

Please check type of Practice:

Internist ———
Pediatrician ———
General ———
Surgeon ———
Other ———

Please answer at once.

---

group represents practically all physicians in Minnesota, whether practicing or not.

The response to the survey quickly became apparent as participation by physicians exceeded expected results. By December 1, a total of 1,556 questionnaires, 50.8 per cent of those sent out, had been returned. Of the total replies, 601 doctors, or 38.6 per cent, reported one or more cases of active rheumatic fever in the last twelve months; that is, a positive report to question 1. Four hundred and eighty-one (30.9 per cent) reported one or more cases of active rheumatic fever in children under fifteen years of age; and 649 (41.7 per cent) reported giving currently some form of prophylaxis to one or more individuals in their practice to prevent the development of rheumatic fever. It is apparent that participation in the survey was not limited to those physicians reporting positive findings only, as negative reports constituted from 58 to 69 per cent of all replies received.

Participation likewise was surprisingly similar by physicians in all parts of the state. Over-all, 50.8 per cent of physicians replied to the questionnaire. When these replies are grouped by counties and compared to the number of physicians to whom the questionnaire was sent in each county, it is apparent that this same percentage participation existed with only slight variation through the entire state. Replies were received from physicians in every one of the eighty-seven counties in the state. The percentage response from the four counties with largest numbers of physicians queried is shown in Table III. These four counties, with 59.5 per cent of all physicians

TABLE III. PARTICIPATION IN SURVEY BY PHYSICIANS IN HENNEPIN, RAMSEY, OLMSTED, AND ST. LOUIS COUNTIES

County	Number of Physicians Queried	Number of Replies	Per Cent Participation
Hennepin	864	476	55
Ramsey	438	210	48
Olmsted	370	142	38
St. Louis	152	106	69
Total	1824	934	51%

queried, returned 60.2 per cent of all replies received. It is apparent, therefore, that the survey results are not disproportionately weighted by the data furnished by physicians in metropolitan areas of the four counties listed above.

Thirty-seven replies, 2.3 per cent of the total, were received from physicians outside the state, whose names and addresses were on the mailing list as members of the Minnesota State Medical Association. These replies have been included in the data bearing upon participation by physicians in the survey but will not be included in data relating to the prevalence and incidence of the disease as reported in the state.

A further test of the validity of the survey findings lies in the participation by doctors carrying on various types of practice. Conceivably specialists in pediatrics, for example, might not have participated in the survey, while surgeons might have uniformly returned questionnaires. Table IV indicates the representation from various types of practices. Unfortunately no figures are available for the total number of doctors in Minnesota falling into the above types of practice, for comparison with the participation figures given. It does not seem unreasonable, however, to assume that roughly 4 per cent of all doctors practicing are pediatricians; 11 per cent, internists; and 45 per cent, general practitioners. If this is accepted, then the participation figures in the survey indicate that a representative sample of all practices responded to the questionnaire and that the data reported is safely acceptable from this standpoint.

The relatively large number of replies from physicians falling into the "other" category of practice, 440 (28.2 per cent) seemed somewhat unusual. As the individual replies were examined more closely, however, this impression lessened. Into the "other" category were placed replies from interns and residents, obstetricians, gynecologists, psychiatrists, urologists, eye, ear, nose, and throat specialists, allergists, proctologists, public health physicians, pathologists, x-ray and radiology physicians, dermatologists, and several other categories of physicians who would not normally diagnose or treat rheumatic fever. It appears that almost 30 per cent of all physicians in the state have no particular chance of contact with patients with this disease. It may be that this fact has contributed to the impression among physicians that rheumatic fever is no longer a serious problem.

TABLE IV. PARTICIPATION IN SURVEY BY VARIOUS TYPES OF PRACTICES

Type of Practice	Number of Replies	Percentage of Total
Internist	173	11.1
Pediatrician	62	4.0
General	713	45.8
Surgeon	168	10.7
Other	440	28.2
Total	1556	99.8

Data reported on the survey questionnaires, however, appear to show that rheumatic fever is currently a serious problem, both in terms of number of active cases, and in terms of number of persons receiving some type of prophylaxis. Replies from out of state physicians have not been included in the following data.

Fifteen hundred and nineteen physicians reported that they were currently treating, or in the last twelve months, had treated, as active rheumatic fever cases, a total of 2,297 patients. This represents a ratio of 1.51 patients for every reporting physician. When compared to the state's population, estimated for April 1, 1954, as 3,138,872, active rheumatic fever cases were reported at a rate of .73 per 1,000 population. Of the total, 2,297 cases reported, 1,434 (62.4 per cent) were indicated to be under fifteen years of age. When these cases are compared to the state's population under fifteen years of age, given as 823,899 in the 1950 federal census, and estimated in 1954 from school census figures as 934,032, active rheumatic fever cases under fifteen years of age were reported at a rate of 1.5 to 1.7 per 1,000 population.

Of the 1,519 physicians submitting replies, 597 (39.3 per cent) reported treating patients for active rheumatic fever. Their patients totaled 2,297 persons, an average of 3.8 cases for each physician reporting cases. When these figures are arranged by type of practice of the reporting physician, as in Table V, it is seen that pediatricians on the average report relatively more patients than do other physicians, with general practitioners and internists reporting about the same average number of patients. The figures for surgeons are perhaps too small to be reliable. Cases of rheumatic fever were reported from eighty-two of the eighty-seven counties in the state. The five counties not reporting cases, Cook, Dodge, Kanabec, Lac Qui Parle, and Red Lake, are rural areas not heavily populated. One reply was received from each of four counties, and two physicians reported from the fifth county.

TABLE V. REPORTED CASES OF ACTIVE RHEUMATIC FEVER, ALL AGES, BY TYPE OF PRACTICE

Type of Practice	Questionnaires Returned	No. of Positive Replies	Number of Cases	Average	Per Cent of Total
Internist	173	73	258	3.5	11.2
Pediatrician	62	45	242	5.3	10.5
General	707	456	1725	3.8	75.0
Surgeon	166	12	48	4.0	2.0
Other	411	11	24	2.1	1.0
Total	1519	597	2297	3.8	99.7

In comparing the numbers of cases reported from various counties, there do not seem to be great differences in the over-all rate from one area to the next. Because only a fraction of the physicians in the state responded to the survey, although this fraction is 50.8 per cent, it is unwise to expect that individual county reports of cases would give reliable rates of the incidence of rheumatic fever in single counties. In such instances, with low county population figures, the presence or absence of a report from one physician in the county would greatly influence the apparent rate. When counties are grouped together, however, into population units of approximately 250,000 and by location in the state, comparative rates of reported cases can be calculated with improved usefulness. Table VI shows this data for groups of counties comprising the eight District Health Units of the state health department.

TABLE VI. REPORTED CASES OF RHEUMATIC FEVER, RATE PER 1,000 POPULATION BY DISTRICTS

District	Headquarters	1954 Estimated Population	Number of Cases	Rate per 1,000 Population
I	Bemidji	227,164	141	0.62
II	Mankato	269,976	273	1.01
III	Rochester	329,853	238	0.72
IV	Duluth	285,438	159	0.55
V	Worthington	227,423	184	0.81
VI	Minneapolis	1,308,909	944	0.72
VII	Fergus Falls	220,812	143	0.64
VIII	Little Falls	269,297	215	0.79
	Total	3,138,872	2297	0.73

Counties in District I: Beltrami, Cass, Clearwater, Hubbard, Itasca, Kittson, Koochiching, Lake of the Woods, Mahnomen, Marshall, Pennington, Polk, Red Lake, Roseau; District II: Blue Earth, Brown, Carver, Faribault, Le Sueur, Martin, McLeod, Nicollet, Scott, Sibley, Waseca, Watonwan; District III: Dodge, Fillmore, Freeborn, Goodhue, Houston, Mower, Olmsted, Rice, Steele, Wabasha, Winona; District IV: Aitkin, Carlton, Cook, Lake, Pine, St. Louis; District V: Chippewa, Cottonwood, Jackson, Lac qui Parle, Lincoln, Lyon, Murray, Nobles, Pipestone, Redwood, Renville, Rock, Yellow Medicine; District VI: Anoka, Chisago, Dakota, Hennepin, Isanti, Kanabec, Ramsey, Washington, Wright; District VII: Becker, Big Stone, Clay, Douglas, Grant, Norman, Ottertail, Pope, Stevens, Swift, Traverse, Wilkin; District VIII: Benton, Crow Wing, Kandivohi, Meeker, Mille Lacs, Morrison, Sherburne, Stearns, Todd, Wadena.

Earlier figures have shown that a considerable number of physicians in all types of practice responded to the survey. Inevitably, general practitioners comprised the largest number of the total, 45.8 per cent, with "others" next, 28.2 per cent, internists and surgeons equally represented, 11.1 and 10.7 per cent, respectively, and pediatricians the smallest group, 4.0 per cent. These figures indicate the participation by physicians in the survey and result from the natural distribution of physicians in various types of practices. When the reported cases of active rheumatic fever are examined in terms of the various types of practice, however, quite different percentages are found. Again, the highest percentage of cases are reported from doctors in general practice, 75.0 per cent. Internists and pediatricians, both specialist types of practice, report equal percentage of cases, 11.2 and 10.5 per cent. Surgeons and others report only 2.0 and 1.0 per cent of cases, as might be expected.

Not all general practitioners, internists, and pediatricians, who returned questionnaires, report treating cases of active rheumatic fever during the past twelve months. This was more frequently true in replies from internists, 57.9 per cent reporting no cases, than in general practitioners, 35.4 per cent, and pediatricians, 27.5 per cent, of whom reported no cases.

When the replies to the second question are considered, some expected differences appear. This question asked for the number of patients under fifteen years of age treated for active rheumatic fever currently or during the past twelve months. The 1,519 physicians returning questionnaires reported a total of 1,434 cases of rheumatic fever in children under fifteen years of age. These cases were reported by only 478 (31.4 per cent) of the total physicians reporting, and represent an average of 3.0 cases for each case-reporting doctor.

Arranging these cases by type of practice of the reporting physician as in Table VII, it is apparent that the average number of cases occurring in children is greatest for pediatricians, with gen-

TABLE VII. REPORTED CASES OF ACTIVE RHEUMATIC FEVER UNDER 15 YEARS OF AGE, BY TYPE OF PRACTICE

Type of Practice	Questionnaires Returned	Positive Replies	No. of Cases	Average Per Reply	Per Cent of Total
Internist	173	27	48	1.7	3.3
Pediatrician	62	45	236	5.2	16.5
General	707	389	1112	2.8	77.5
Surgeon	166	11	26	2.3	1.8
Other	411	6	12	2.0	0.8
Total	1519	478	1434	3.0	99.9

eral practitioners reporting the next highest average. Also for these younger patients, the percentage of all the cases reported by pediatricians rises, and the percentage reported by internists drops considerably, as compared to the situation for rheumatic fever cases regardless of age. Again, however, the general practitioner group reports by far the greatest percentage of the total number of cases, 77.4 per cent.

In addition to the five counties not reporting any cases of rheumatic fever, three other counties, Clearwater, Lake, and Sherburne, reported no cases in children under fifteen years of age. Only one physician returned a questionnaire from one of these counties, and two replies were received from each of the other two counties.

The same comments regarding the distribution of cases by counties that were made earlier in relation to all reported cases hold true for the cases in children under fifteen years. It is true that pediatricians are relatively few and located in more metropolitan areas, but their data is likewise included in the Table VI showing rates per 1,000 population by districts.

Again it is difficult to explain why some physicians report treating cases while other physicians do not. Seventeen (27.5 per cent) of all the pediatricians returning questionnaries reported treating no cases of active rheumatic fever in children currently or within twelve months. Their colleagues who did report cases averaged 5.2 such cases in their practices. It would seem that if the disease occurs to that extent in the practice of forty-five (72.5 per cent) of all pediatricians, the remaining pediatricians should be seeing some cases. Further study of the negative replies may help to explain this.

The third question of the survey asked the doctor to report the number of individuals in his practice to whom he was currently giving some form of prophylaxis to prevent the development of rheumatic fever. The question was intended to give another indirect numerical measure of the size of the rheumatic fever problem in general, to supplement the data regarding active cases of the disease.

TABLE VIII. REPORTED NUMBER OF INDIVIDUALS RECEIVING PROPHYLAXIS AGAINST RHEUMATIC FEVER, BY TYPE OF PRACTICE

Type of Practice	Questionnaires Returned	No. of Positive Replies	Number of Individuals	Average	Per Cent of Total
Internist	173	95	433	4.5	13.0
Pediatrician	62	50	624	12.4	18.8
General	707	473	2183	4.6	65.6
Surgeon	166	14	55	3.9	1.6
Other	411	12	28	2.3	0.8
Total	1519	644	3323	5.1	99.8

Of the 1,519 physicians returning questionnaires, 644 (42.3 per cent) reported that they were giving prophylaxis to their patients. This is a slightly higher proportion of doctors than reported actual cases of the disease, indicating that physicians recognize the importance of prevention of the disease even when they are not seeing cases in their practice. The 644 physicians reported a total of 3,323 individuals who were being given some form of prophylaxis. This is an average of 5.1 persons for each reporting doctor. Compared to the total number of active cases of rheumatic fever reported, 2,297, an average of 1.4 individuals were receiving prophylaxis for every case reported.

When the data is arranged by type of practice of the reporting physician as in Table VIII, it becomes apparent that pediatricians as a group prescribe prophylaxis for almost three times the average number of individuals that other physicians do. Very little difference appears among internists, general practitioners, and surgeons.

Again, general practitioners reported the largest portion of all the individuals receiving prophylaxis, but internists and pediatricians reported an appreciable number, greater in terms of percentage than their share of all active cases of rheumatic fever reported in the survey. Doctors from eighty-five of the state's eighty-seven counties reported giving prophylaxis of some kind to individuals in their practices. One negative report was received from one county, Kanabec, where four physicians were queried, and one negative questionnaire was returned from the second county, Dodge, where seven physicians were queried.

Variations in the degree to which prophylaxis was reported from various counties is shown in Table IX, where counties are grouped into districts.

The significance of the data reported on the questionnaires is difficult to determine. It must be remembered that the questions called for a quick numercial answer that in many cases, no doubt, was solely an estimate. However, the average number of cases or individuals receiving prophylaxis reported in any doctor's practice was uniformly small, so that his estimate would seldom be very far off. More often, the doctor would know exactly how many such patients to report. Undoubtedly there may be some duplication of reporting, inasmuch as one patient may have visited more than one physician, but it is felt that this is not a major source of error. It should be remembered that only half of all the physicians who were sent questionnaires returned them. Because the participation by physicians, despite this response, was still fairly representative of all areas, types of practice, and type of response whether positive or negative, it may be argued that the reported numbers of cases and individuals receiving prophylaxis could be safely doubled on the basis of results reported.

TABLE IX. REPORTED NUMBER OF INDIVIDUALS RECEIVING PROPHYLAXIS, RATE PER 1,000 POPULATION, BY DISTRICTS

District	Headquarters	1954 Estimated Population	Number of Individuals	Rate Per 1,000 Population
I	Bemidji	227,164	135	0.59
II	Mankato	269,976	340	1.25
III	Rochester	329,853	417	1.26
IV	Duluth	285,438	185	0.64
V	Worthington	227,423	267	1.17
VI	Minneapolis	1,308,909	1501	1.14
VII	Fergus Falls	220,812	243	1.09
VIII	Little Falls	269,297	235	0.87
	Total	3,138,872	3323	1.05

Be that as it may, another serious question affecting the significance of the survey results lies in the nature of the disease which the doctor reported as a case of active rheumatic fever, or against which he was prescribing prophylaxis. Comments on a number of replies indicated that some physicians feel that the diagnoses of rheumatic fever made by their colleagues do not represent true instances of the disease, and that the term rheumatic fever is applied much too loosely to fairly large numbers of illnesses for want of a more exact diagnosis. It is hoped that additional study of a few representative counties, with more regard to the clinical disease entity reported by physicians, will help to clarify this situation. The present survey, by definition, aimed solely at assessing the rheumatic fever problem as defined by individual practicing physicians.

TABLE X. REPORTED CASES, PER 1,000 POPULATION, OF POLIOMYELITIS, RHEUMATIC FEVER, AND TUBERCULOSIS, MINNESOTA, SELECTED YEARS

Disease	Maximum Year, 1950-54		Minimum Year, 1950-54	
	Cases	Rate Per 1,000	Cases	Rate Per 1,000
Poliomyelitis: All ages	3926	1.28	502	.17
Under 15 years	2546	2.92	315	.38
Tuberculosis: All ages	2688	.90	1629	.52
Under 15 years	115	.14	82	.09
	Cases		Rate	
Rheumatic Fever: All ages	2290		.73 (1955 Survey)	
Under 15 years	1428		1.53 (1955 Survey)	

The reported incidence rates for active rheumatic fever may be compared with similar rates for other diseases, commonly recognized as problems. Table X shows these figures, from data of the Minnesota Department of Health. When the recurrent, long term nature of rheumatic fever, with its serious disabling complications, are recalled, these rates would indicate the real problem that the disease still poses.

Summary

Of 3,063 questionnaires on the current problem of rheumatic fever sent to physicians in Minnesota, 1,556 were returned. Five hundred and ninety-seven reported a total of 2,297 cases of active rheumatic fever, from eighty-two of the state's eighty-seven counties. Of the cases, 1,434 were under fifteen years of age. Six hundred and forty-four physicians reported that they were giving some form of prophylaxis to prevent the development of rheumatic fever to a total of 3,323 individuals..

These data, from 50.8 per cent of all physicians queried, indicate an incidence rate of rheumatic fever, of .73 cases per 1,000 population, all ages, or 1.5 to 1.7 per 1,000 population for children under age fifteen years. The data indicate also that at least 1.05 persons per 1,000 population are currently receiving some form of prophylactic therapy to prevent rheumatic fever.

Home Accident Prevention

A. B. ROSENFIELD, M.D., M.P.H.
Minneapolis, Minnesota

HOME accidents are causing a death every eighteen minutes and an injury every seven seconds in the United States. In Minnesota last year, one out of every fifty-two deaths was caused by a home accident. Fatal accidents are only part of the picture. According to the National Safety Council, for every fatal home accident there are four permanent disabilities and from 100 to 150 non-fatal accidents. This means that in addition to the 538 men, women and children who lost their lives as the result of home accidents in Minnesota in 1954, more than 2,000 were permanently disabled and about 70,000 suffered minor or more serious injuries.

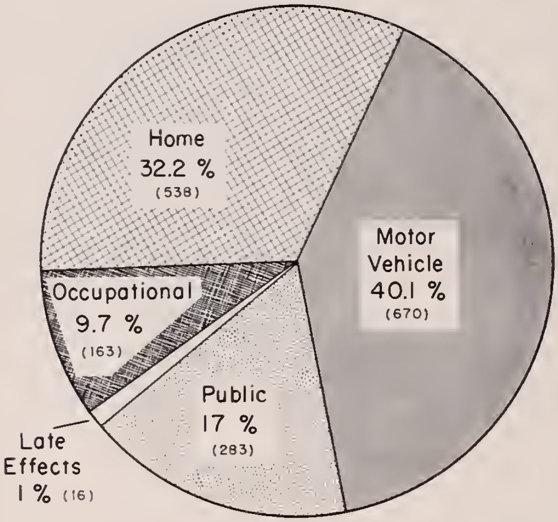


Fig. 1. Accidental deaths by major classification (1670 deaths) by occurrence in Minnesota, 1954. Minnesota Department of Health.

Now, just what is an accident? One dictionary defines an accident as an unexpected or unforeseen event, generally unfortunate. Many of the events that are tabulated as accidents would hardly qualify under this definition, except for the last phrase, "generally unfortunate." The National Safety Council states that an accident includes any suddenly occurring unintentional event which causes injury or property damage. A home accident is one that takes place within the home or on the home premises.

There was a total of 1,670 accidental deaths in Minnesota in 1954. Of these, 670 (40 per cent) were motor vehicle deaths; 538 (32 per cent) were home fatalities. Thus, home fatalities are almost as serious a problem as motor vehicle deaths, actually less than 8 per cent difference; yet traffic accidents steal the limelight because they are spectacular and home accidents receive comparatively little public attention (Fig. 1).

Falls account for the greatest number of fatal home accidents, 317 (60 per cent). Next, in order of frequency, were burns, responsible for 75 deaths; poisoning, 37; mechanical suffocation, 32; firearms, 13; drowning, 9; and machinery accidents, 8 deaths (Fig. 2).

Age is a significant factor in home accidents, with the extremes of life most frequently affected. Home accidents killed 308 people 65 years of age and older, and 77 persons from 45 to 64 years (Table I). They also took the lives of 82 children under five years of age, and 33 from 5 to 14 years. There were only 38 deaths between 15 and 44 years of age. Thus, more than half (57 per cent) of home fatalities involved those 65 years and older, and 71 per cent were 45 years of age and older. Twenty-one per cent were under the age of 15 years.

TABLE I. HOME ACCIDENT DEATHS BY SPECIFIC AGE GROUPS, MINNESOTA, 1954

Ages	All Ages	0-4 Years	5-14 Years	15-24 Years	25-44 Years	45-64 Years	65 and Over
Totals	538	82	33	6	32	77	308
Per cent	100.0	15.2	6.1	1.1	6.0	14.3	57.3

As to sex, under the age of nineteen, there are twice as many fatal accidents in boys as in girls. In old people this is reversed. In those sixty-five

---

Dr. Rosenfield is Chief, Section of Maternal and Child Health, Minnesota Department of Health.

Presented at Minnesota Public Health Conference, September 30, 1955, at Minneapolis, Minnesota.

years of age and older there are twice as many fatalities in women as in men.

The leading cause of death in childhood is not heart disease, cancer, or communicable disease. And certainly not poliomyelitis. Accidents are the leading cause in childhood, responsible for more than one-third of all deaths and equalling the total of the next four or five leading causes combined (Fig. 3). In 1954, accidents caused as many deaths as the total caused by cancer, pneumonia and influenza, diseases of the central nervous system, poliomyelitis, nephritis, rheumatic fever, measles, and tuberculosis.

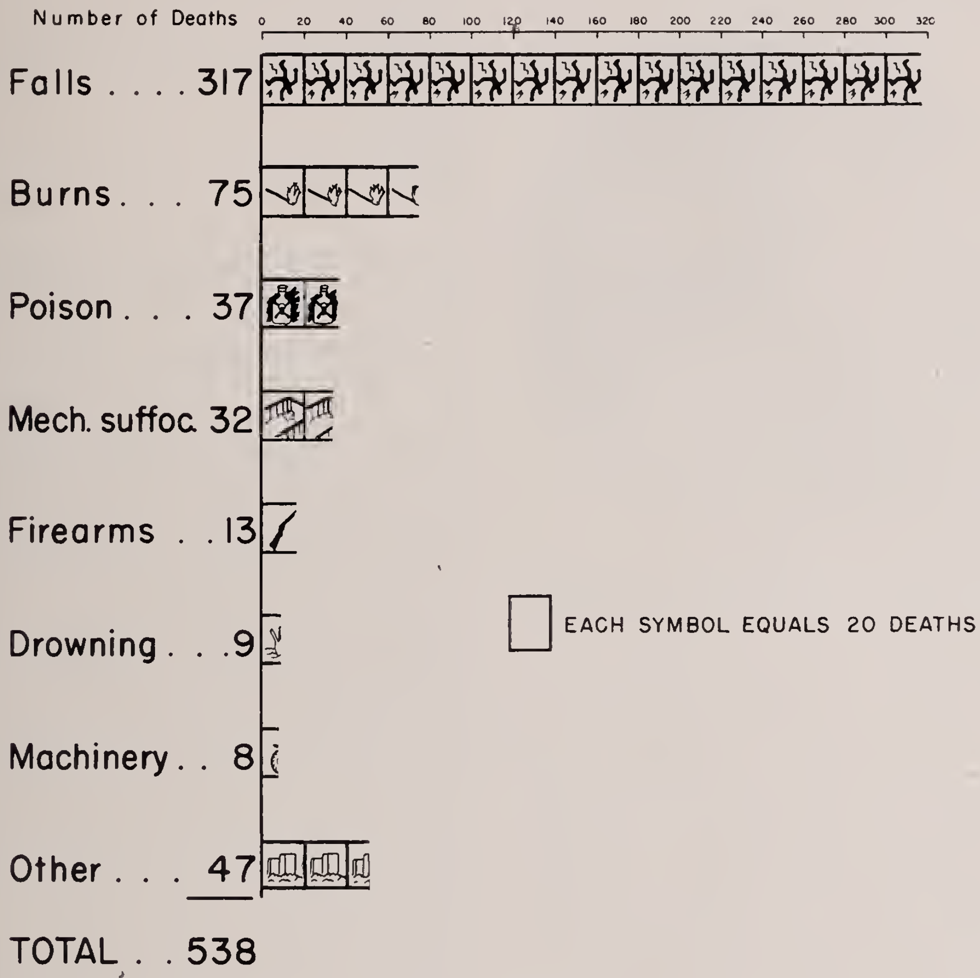


Fig. 2. Major causes of fatal home accidents by occurrence in Minnesota, 1954. Minnesota Department of Health.

While one-half of fatal child accidents are home fatalities the specific causes of child fatalities differ somewhat from the home accident summary, because motor vehicle and other public accidents are included (Table II). Of the 244 accidental deaths in children under the age of fifteen in 1954, eighty-two (33.6 per cent) were motor vehicle fatalities and forty-two (17.2 per cent) were drownings. Thus, motor vehicle fatalities are the leading cause of accidental deaths in childhood, responsible for one-third of such deaths. These include not only non-collision and collision of motor vehicles in which children are riding or driving but also motor vehicle-bicycle accidents as well as motor vehicle-pedestrian accidents. Motor vehicle-pedestrian accidents account for one-half of motor vehicle deaths in children. Of these three-fourths are under ten years of age, an age during which close parental supervision should prevent most of these fatalities. These involve children playing in the streets, darting behind cars into the street, chasing balls or toys into the path of automobiles, or crossing the street or road other than at intersections. These accidents also include fatalities in the driveway, garage, front of the home or in the back yard, frequently, because parents failed to "stop, look, and listen" before driving their car.

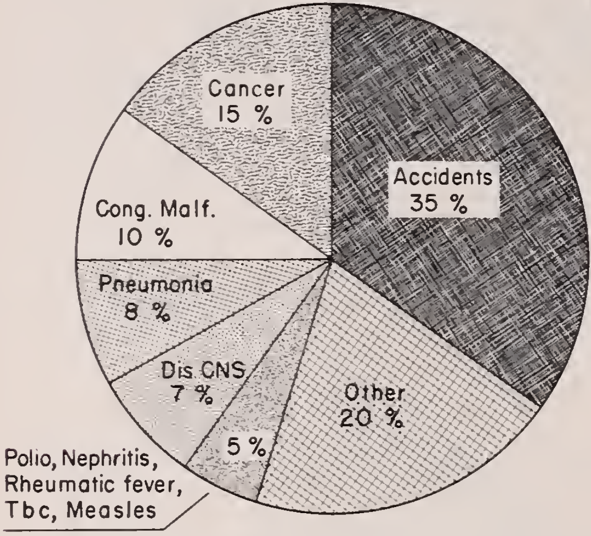


Fig. 3. Leading causes of death among children one to fifteen years by occurrence in Minnesota, 1954. Minnesota Department of Health.

Drownings are the second leading cause of accidental deaths in children, responsible for one-sixth of the deaths (17.2 per cent). These include public as well as home drownings. Drownings occur because babies are left in the bathtub while the mother answers the phone or doorbell; because young children are left near unfenced garden pools, near water troughs, open wells or cisterns on the farm; because children do not know how to swim, or swim alone or dive in unexplored water. Drownings occur because we disregard safe rules of boating, swimming and skating and because we do not know life saving measures.

In home accidents, falls are the leading cause of death (Table III). Falls took the lives of 302 persons forty-five years of age and older, almost 90 per cent of these being sixty-five years and over. Only fifteen fatal falls were recorded for persons under forty-five years of age, and eleven of these occurred in children under the age of fifteen. It is evident that falls are a particularly serious problem for those in the sixth decade of life and beyond where the physical infirmities of older age play an important role. While falls are frequent in children they cause few deaths in this age group.

TABLE II. PRINCIPAL CAUSES OF ACCIDENTAL DEATHS IN CHILDHOOD 0-14 YEARS, BY NUMBER AND PER CENT, MINNESOTA, 1954

Type of Accident	Number	Per Cent
Total	244	100.0
Motor Vehicle	82	33.6%
Drowning	42	17.2
Mechanical suffocation	30	12.3
Burns and conflagration	22	9.0
Obstruction or suffocation by food or external means	17	7.0
Falls	12	4.9
Machinery	10	4.1
Firearms	9	3.7
Poisoning	8	3.3
Other	12	4.9

Fatal falls result from accidents in all rooms of the home, on the stairs, as well as in the yard. They occur from tripping over a carpet, from stair carpeting and scatter rugs that are not tacked down or do not have non-skid rubber backing; from poor arrangement of furniture with foot stools, magazine racks, smoking stands and other small pieces of furniture placed where they can be tripped over. Falls occur from inadequate lighting, from lack of bedside lights and readily accessible light switches, and from lack of hand grips and bath mats for shower stalls and tubs. Fatal falls occur from use of makeshift ladders of boxes or chairs, from using stairs as storage areas, from leaving roller skates and other toys on the steps or floor. Falls also occur from leaving garden tools and other equipment lying about the yard and from slippery steps and walks. Prevention requires good housekeeping, periodic checkups and proper supervision of the infirm and aged.

Burns caused seventy-five deaths in 1954. Thirteen deaths occurred among children under the age of five, and twenty-two were sixty-five years or older. Thus, almost half occurred at the extremes of life. Fatal burns resulted from permitting babies and toddlers in the kitchen while meals were being prepared, or near containers of boiling water or hot grease, or having pot and pan handles on the stove where youngsters could reach them. Fatal burns resulted from failure to keep matches in metal containers out of reach of children, from faulty gas stoves or furnaces, chimneys and flue passages, and from untended trash burning or bonfires. Burns were also caused by careless smoking, especially in bed, and from the foolhardy practice

TABLE III. HOME ACCIDENT DEATHS BY CAUSE AND SPECIFIC AGE GROUPS
MINNESOTA, 1954

Type of Accident	All Ages	0-4 Years	5-14 Years	15-24 Years	25-44 Years	45-64 Years	65 and Over
Home Total	538	82	33	6	32	77	308
Falls	317	4	7	—	4	30	272
Fire, explosion, burns	75	13	7	3	15	15	22
Poisonings	37	7	1	1	7	17	4
(gas excepted)	(16)	(7)	(1)		(4)	(4)	
Mech. suffocation	32	30	—	1	—	1	—
Firearms	13	—	6	1	2	2	2
Machinery	10	3	7	—	—	—	—
Other	54	25	5	—	4	12	8

of pouring gasoline or kerosene on fires to kindle or hasten them.

Accidentally swallowed poison resulted in seven deaths in children under age five, almost half of the sixteen poisonings of this type. Poisonings resulted from leaving medicines, poisons, and cleaning compounds as lye, ammonia or silver polish where children could reach them; from failure to read labels on medicine; from failure to clearly mark poisons and to keep them locked up; from taking medicine in the dark, and from failure to promptly take the proper antidote and to call a physician.

Poisoning from gas and vapors occurred mostly in adults and resulted in twenty-one deaths. They are most frequently the result of running the motor of a car in a closed garage, and occasionally from use of unvented gas heaters, or from gas escaping as a result of the flame being extinguished by boiling water on a gas stove.

There were more deaths from firearms in and around the home than from hunting accidents. Ten occurred as the result of hunting accidents; thirteen were home fatalities. Of the latter, six were between five and fifteen years of age. Accidents involving firearms are due to failure to unload guns, cleaning guns improperly, dropping or knocking them off a support, leaving guns where children can find them, and neglecting to keep guns and ammunition in separate places and locked up. These accidents happen because children and youth are not taught the dangers of firearms, and are not properly trained in the safe handling and use of firearms.

A few words should be said about mechanical suffocation in bed or cradle, listed as the cause of death in thirty children under the age of one in 1954. Many so-called cases of suffocation by bed clothes are actually the result of an acute respiratory infection, frequently virus in origin. While some of these deaths may be due to suffocation, many are due to unrecognized fulminating disease. Under such circumstances it is important that an adequate autopsy be carried out. Only by this means will it be possible to avoid that unfortunate "guilt complex" that parents may develop in the belief that carelessness was responsible for the death of their baby.

Home accidents are of particular concern to public health workers because: (1) they affect large numbers of people; (2) they affect every locality and every age group; (3) they are the leading cause of death in childhood; and (4) they are in seventh place among the ten leading causes of death in Minnesota. Home accidents have become one of our serious public health problems.

How individuals can best be made aware of the implications of safe homes, safe equipment and safe habits is still an unanswered question. The greatest obstacle to home accident prevention, according to the National Safety Council, is the fact that each householder must be his or her own "safety engineer." Unfortunately most householders are unaware that there are any serious hazards in the home or yard. It is important to note that accident prevention is not only a physical problem but is also a psychological problem. It must also be emphasized that accidents do not just happen; they are not acts of God. Accidents are caused. They are caused either by defects in the environment or by defects in human behavior, or more often by both. Therefore, there are practical methods for reducing the number and severity of home accidents.

Health workers must first be acquainted with the size and extent of the problem. They must know the number and type of fatalities and their relative importance in comparison with other causes of death. They must know the causes of home accidents, by type of accident and specific age group, and the specific preventive measures. They must, of course, know how to apply public health methods and techniques.

Public health workers should participate in the tabulation and analysis of records to determine the local problem by: (1) study of home accident death certificates, (2) follow-up of fatal home accidents through the family, the physician or the coroner, (3) study of non-fatal accidents in the community. They should help develop and promote the reporting of all accidents in the schools. They should promote the study of home accident cases in local hospitals through the local medical society and hospital staffs. They should participate in safety inspections. They should stimulate interest in the development and extension of local safety councils or other civic groups interested in home safety.

Finally, certain health workers and their possible contributions to the home safety program should be specifically mentioned.

The Physician.—The general practitioner has a vital role in attempting to reduce the toll from childhood accidents. He sees about 90 per cent of all children, while pediatricians see about 10 per cent. By pointing out to parents the physiology and development of the child and the anticipated changes, the physician can teach parents the necessity for child protection in early life from danger he cannot appreciate. Children under the age of one are entirely dependent upon some adult for their comfort, their care, their feeding, and their safety. He can point out the need for education and planned experiences in later childhood, within the limits of his developmental abilities, specific interests and local opportunities. And, when reason is not possible he can impress upon parents the necessity for discipline. With the aged, good medical care and adequate supervision are necessary and adjustments must be made for their years and needs.

The *public health nurse* is a key person in home safety because of her easy access to and acceptance in the home. She has the opportunity to observe the habits of the mother, the use of faulty equipment and poor housekeeping. She should observe potential accident hazards and should suggest corrections. She should incorporate home safety in her home visits by emphasizing safety in her teaching especially in maternal, infant, child, nutrition, care of the aged and in the administration of medications and treatments. Home safety should be included in her school activities as well as through teacher-parent-child and nurse conferences. She should interpret accident causes and prevention to community groups and should encourage community participation in home accident prevention activities. Perhaps it might be more effective to stress injury prevention activities.

Public Health engineers and sanitarians should include the investigation of potential hazards and safety education in their daily activities. Sanitation personnel can bring to the attention of the householder existing environmental hazards in the home or yard, unsafe activities, and the best means of controlling or eliminating such dangers.

Health educators can assist in the development and extension of home safety programs and can develop effective audio-visual aids as literature, films, slides, exhibits, as well as radio and television scripts and news releases to be used in such programs.

These techniques are the ones which health workers apply to other phases of preventive medicine: education, inspection, and the recognition and correction of physical, mental, emotional and environmental defects. These techniques should stimulate the family to develop safe habits and practices; they should promote community interest and participation in effective home safety activities; they should ultimately lead to a lowered incidence of home accidents.

BILIARY STRICTURE

(Continued from Page 195)

4. Eliot, E., Jr.: The repair of hepatic and common bile ducts. Surg., Gynec. & Obst., 26:81, 1918.
5. Eliot, E., Jr.: Benign cicatricial strictures of the bile ducts. Ann. Surg., 104:668, 1936.
6. Langenbuch, C. J. A.: Berlin klin. Wchschr., 19: 725-727, 1882.
7. Lahey, F., and Pyrtek, L.: Experience with the operative management of 280 strictures of the bile ducts. Surg., Gynec. & Obst., 91:25-26, 1950.
8. Walters, W.: Strictures and injuries of bile ducts. A study of results of operations in 80 cases. J.A.M.A., 113:209-213, 1939.
9. Walters, W.: Physiological studies in cases of stricture of the common bile duct—a 28 year survey with data on 254 patients. Ann. Surg., 138:609, 1953.
10. Walters, W., and Kelly, A. H.: Surgical treatment of stricture of common and hepatic bile ducts: 28 year survey. Arch Surg., 66:244, 1953.

Now Available

7 Years Sickness Benefits

(HOUSE CONFINEMENT NOT REQUIRED)

Lifetime Accident Benefits

This extension of benefits is now available to you as a member of the Minnesota State Medical Association. Since December, *1947*, the inception date of our plan for members of your Association, the Caswell-Ross Agency has attempted at all times to secure for you the finest coverage in the accident and sickness field. These improvements will make your policy the best among many available to you. An application has been sent to you previously—why not complete and return it to our office now.

CASWELL-ROSS AGENCY

1177 N. W. Bank Building
Minneapolis 2, Minnesota
Minneapolis—FE 2-2585
St. Paul—MI. 5-7004

Administrators of Professional Disability Plans

Minnesota State Bar Association
Minnesota State Dental Association
Minnesota Society of C. P. A.
Minnesota State Pharmaceutical Assn.
Minnesota Auto Dealers Association
Minnesota Federation of Eng. Societies
Minnesota State Veterinary Medical Soc.
Hennepin County Medical Society
Hennepin County Bar Association
11th Judicial Bar Association
Minneapolis Association of Life Underwriters
Minnesota State Life Underwriters Assn., Inc.
Ramsey County Medical Society
Ramsey County Bar Association
St. Paul District Dental Soc.
Minneapolis District Dental Soc.
St. Cloud Dental and Stearns County Medical Society
Duluth District Dental Society
East Central Medical Society
St. Louis County Medical Society
West Central Dist. Dental Society
Northwest Proprietors Association
St. Paul Life Underwriters, Inc.

TRANS WORLD AIRLINES
TWA

HORN & HARDART RESTAURANT

ACHROMYCIN*

Tetracycline *Lederle*

in the treatment of

respiratory infections

January and his associates[1] have written on the use of tetracycline (ACHROMYCIN) to treat 118 patients having various infections, most of them respiratory, including acute pharyngitis and tonsillitis, otitis media, sinusitis, acute and chronic bronchitis, asthmatic bronchitis, bronchiectasis, bronchial pneumonia, and lobar pneumonia. Response was judged good or satisfactory in more than 84% of the total cases.

Each month there are more and more reports like this in the literature, documenting the great worth and versatility of ACHROMYCIN. This antibiotic is unsurpassed in range of effectiveness. It provides rapid penetration, prompt control. Side effects, if any, are usually negligible.

No matter what your field or specialty, ACHROMYCIN can be of service to you. For your convenience and the patient's comfort, Lederle offers a *full* line of dosage forms, including

ACHROMYCIN SF

ACHROMYCIN with STRESS FORMULA VITAMINS. Attacks the infection—defends the patient—hastens normal recovery. For severe or prolonged illness. Stress formula as suggested by the National Research Council. Offered in Capsules of 250 mg. and in an Oral Suspension, 125 mg. per 5 cc. teaspoonful.

For more rapid and complete absorption. Offered only by Lederle!

dry-filled sealed capsules

---

[1] January, H. L. et al: Clinical experience with tetracycline. *Antibiotics Annual* 1954-55, p. 625.

Lederle

LEDERLE LABORATORIES DIVISION
AMERICAN CYANAMID COMPANY
PEARL RIVER, NEW YORK

*REG. U. S. PAT. OFF.

PHOTO DATA: 4X5 VIEW CAMERA, F5.6, 1/25 SEC., EXISTING LIGHTING AT DUSK, ROYAL PAN FILM.

tolerance . . . . *the key*
to successful
IRON THERAPY

Fergon®
IRON WITHOUT IRRITATION

NO NAUSEA
NO ABDOMINAL CRAMPS
NO CONSTIPATION
NO DIARRHEA

higher hemoglobin response

Supplied:

Fergon, tablets of 5 grains, bottles of 100 and 500.

Fergon, tablets of 2½ grains, bottles of 100.

Fergon elixir 6% (5 grains per teaspoonful), bottles of 16 fl. oz.

New
HIGH POTENCY Fergon Plus Improved Caplets® (Fergon with vitamin B_{12} and intrinsic factor, folic acid and vitamin C; 2 Caplets = 1 U.S.P. oral unit of antianemia activity), bottles of 100 and 500 easy to swallow Caplets.

Winthrop
LABORATORIES | NEW YORK 18, N. Y.

Fergon (brand of ferrous gluconate) and Caplets, trademarks reg. U.S. Pat. Off.

Case Presentations

Hematoma of the Rectus Abdominis Muscle

JOHN EILER, M.D.
Park Rapids, Minnesota

NO DOUBT more cases of hematoma of the rectus abdominis muscle occur than are recognized, but the entity is rare enough to cause nterest when encountered. I have seen only two uch patients in nineteen years of general pracice.

Diagnosis

A hematoma of the rectus abdominis muscle may e mistaken for a number of intra-abdominal onditions. In only a small percentage of the ases is the diagnosis made preoperatively. This due to the rarity of the condition, as the diagnosis should not be mistaken if kept in mind. The diagnosis is not as simple, however, as seems bvious to the uninitiated. In addition to right ower quadrant pain, nausea and moderate eukocytosis complicate the picture.

Anatomy and Mechanics Involved

The rectus abdominis muscle undergoes great tress in carrying out the ordinary functions, as vell as the unusual ones, to which it falls heir. t must take part in such activities as coughing nd sneezing, defecation and regulating intrabdominal pressure.

The blood supply of the muscle is from the uperior and inferior epigastrics. They flow ephalad and caudad, respectively, in a groove n the dorsal surface of the rectus muscle for a hort distance before entering the substance of e muscle. This dorsal location of the vessels blood supply obviously was intended to prevent pture of the vessels and the consequent hemama formation. Incidentally, absence of the osterior rectus sheath, caudad from the linea micircularis of Douglas, is no doubt instrumental bringing about symptoms simulating intradominal pathology when thrombosis occurs, as nearly always does, near the distal end of the uscle.

Another salient feature of the anatomy of the tal end of the rectus muscle is that a hematoma ere not only can dissect laterally but may spread to the opposite side. In addition to peculiarities of the anatomy, there are such precipitating causes as coughing, child bearing, athletics, direct trauma, debilitating diseases and blood dyscrasias.

Report of a Case

A twelve-year-old white boy was brought to my office by his parents on July 23, 1954. The parents gave a history that "the boy ruptured himself a couple of days ago." Examination revealed no cough reflex in the inguinal canal, but he did display a rigid, tender mass just proximal to the symphysis pubis on the right side. He was nauseated and his white blood cell count was 9,000 per cubic mm. He was sent home with instructions to keep an ice bag over the mass continuously and to carry out strict bed rest. Menadione, gr. 5 three times daily was prescribed.

The parents reported back to my office every few days, assuring me that the patient was improving. However, they brought him to my office on July 28, 1954, at which time there was a large fluctuating mass at the site of the previous small rigid one. The skin over the area was deeply discolored. He was taken to the hospital for operative intervention.

The distal portion of the right rectus muscle was exposed by a paramedian incision down to and including the anterior rectus sheath. Most of the clot was easily evacuated, but some of it was intimately associated with the fibers of the muscle. Considerable active bleeding was encountered. The sources of this were sought out and the vessels ligated. A fairly dry field was obtained, and the incision was closed in layers without drainage. A pressure dressing was applied and an ice bag was kept over this for the first two postoperative days.

Microscopic section of the clots removed showed fibrocollagenous tissue with areas of fibroblastic proliferation and round cell infiltration. A few well formed capillaries were scattered through the tissue.

The patient's convalescence left much to be desired since the mass had returned to its preoperative size by the third day. Removing two sutures to provide drainage, and continuous boric acid solution packs turned the tide, however. He was discharged on August 9, 1954, with instructions to continue with the boric acid solution packs at home. It required about a month before his recovery was complete.

My second patient was that of a twenty-six-year-old veteran. He went to a veteran's hospital after my diagnosis, and I was unable to follow the course of his illness.

(Continued on Page, 222)

Pheochromocytoma in a Seven-year-old Girl

Report of Successful Removal

BERNARD J. SPENCER, M.D.
O. S. WYATT, M.D., an
TAGUE C. CHISHOLM, M.D
Minneapolis, Minnesot

A PHEOCHROMOCYTOMA is a functioning tumor of chromaffin tissue which usually arises in the adrenal medulla. Since chromaffin cells secrete epinephrine and nor-epinephrine, the tumors characteristically produce hypertension which may be paroxysmal or sustained.

Although the tumors are rare in children, they should be considered in the differential diagnosis of any hypertensive child because they represent a curable form of hypertension. Delay in diagnosis steadily increases the jeopardy of the patient.

This case is presented to illustrate the clinical course and surgical cure of one of the few patients reported during the first decade of life.

Case Report

History.—A seven-year-old girl was admitted to the hospital on April 14, 1953, with the chief complaints of severe headaches, irritability and episodes of nausea. The headaches began about a year prior to admission and occurred at irregular intervals. They were increasing in frequency and severity the past two months and were precipitated by any physical or emotional strain such as attending a birthday party or being teased by her brother. Her irritability had become so marked that despite sedation and analgesics, she had become unmanageable at home during the past week. She was anorexic, losing weight and had increasing bouts of nausea and vomiting. Drenching sweats were noted, despite her normal temperature.

Physical Examination.—The patient was thin and wore an anxious and distressed expression (Fig. 1a). She was 47 inches tall and weighed 37 pounds. Her temperature was 98.8° (rectal), pulse 130, respirations 24, and blood pressure upon admission was 194/150. The eye grounds showed a slight hyperemia of the right disc. No vascular spasm or papilledema was evident. There was a mild hypertrichosis of the face, trunk and extremities. Heart tones were loud with snapping systolic and diastolic sounds, but no murmurs were heard. Abdominal examination revealed no abnormality.

Laboratory Data.—The hemoglobin level was 14.6 gms., red blood count 4.77 million, leukocytes 10,650 with 67 per cent neutrophils, 31 per cent lymphocytes and 2 per cent monocytes. Urinalysis revealed 1+ albumin and 2-6 hyaline casts per low power field Determinations of blood urea nitrogen, basal metaboli rate and serum electrolytes were normal.

X-rays of the chest, skull and intravenous pyelogram revealed no abnormality.

An electrocardiogram showed a sinus arrhythmia an a tendency to right axis deviation.

Special Study.—Since the diagnosis of pheochromocytoma was suspected, a test using the adrenolytic agent benzodioxane, was done (Fig. 2). With the patien resting quietly blood pressure levels around 220/18 were first recorded. Following intravenous injection 10 mg. of benzodioxane the pressure fell within a minut to 120/60 where it remainded over five minutes.

Operation.—A polythene cannula was placed in th saphenous vein and 5 per cent glucose in water containing 4 cc. of Levarterenol (Levophed) per liter wa connected. A syringe of the depressor drug, phentolamine (regitine) was in readiness. A tranverse uppe abdominal incision was made. Gentle palpation reveale a tumor nearly 2 inches in diameter in the righ adrenal area. The remainder of the possible chromaffin tissue sites in the abdomen was examined includin visualization of the left adrenal which appeared normal The right adrenal tumor was then removed throug a transperitoneal approach. Despite the fact that th patient was receiving intravenous solution containin Levophed, she had a profound drop in blood pressur when the tumor was removed; and it was an hour late before she had stabilized well enough to be moved fro the operating table.

Pathologic Report.—The tumor measured 4 by 4 b 3 cm. and weighed 16 gm. (Fig. 3). The cut surfac had a pale tan color. Histologic sections showe pheochromocytoma.

Postoperative Course.—The patient did well until th second postoperative night when she experienced a ge eralized convulsion. She received intravenous sodiu amytal at intervals during the night and was n oriented for nearly twenty-four hours. The remaind of her convalescence, however, was most gratifying. H blood pressure remained stabile and she required r Levophed after the third post-operative day. The r duction in her pressure following surgery is shown i Figure 4. Her headaches, hyperhidrosis and nause ceased. The albuminura cleared within a week. H disposition and countenance reflected these improvements, and she was discharged on the twelfth postoperative day. Her improvement in the intervening two years may be noted in the recent photograph shown in Figure 1b. At her most recent office visit, a blood pressure of 100/62 was obtained.

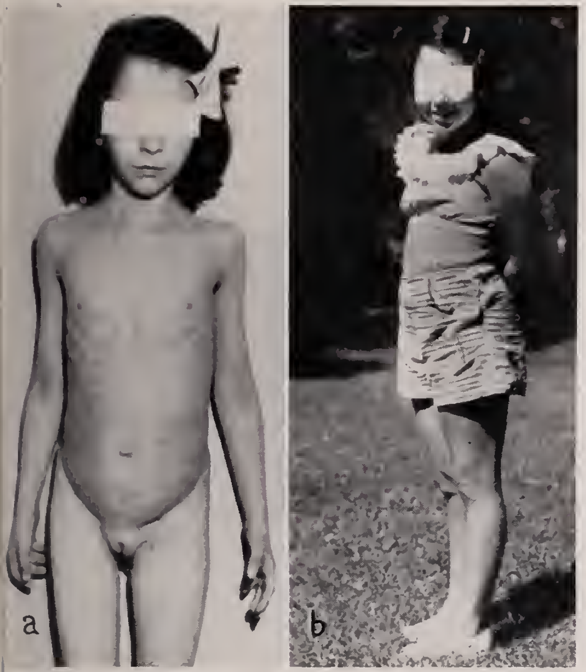


Fig. 1. Appearance of seven-year-old patient. (a) Preoperative. (b) Two years after operation.

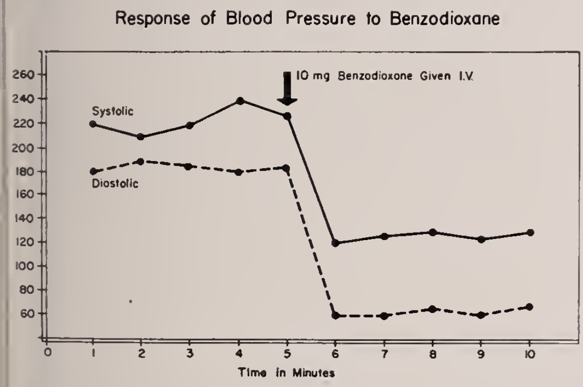


Fig. 2. Response of blood pressure to benzodioxane ijection.

Comment

The first adequate clinical description of hyper-ensive crisis in association with an adrenal tumor as given by L'abbe in 1922.[1] Charles Mayo reorted the first successful operative removal of ich a tumor with relief of symptoms in 1927.[2]

About three hundred patients have now been escribed in the literature who have been diagnosed in life or at autopsy. We were able to find reports on thirty-two children under the age of fourteen years.[3,4,5] The symptomatology parallels the adult cases in essential respects with anxiety and nervousness, hyperhidrosis and headaches the most common features in their histories. Of the thirty-two children reported, ten were diagnosed at autopsy, eight died at operation and fourteen survived surgical removal of the tumor.

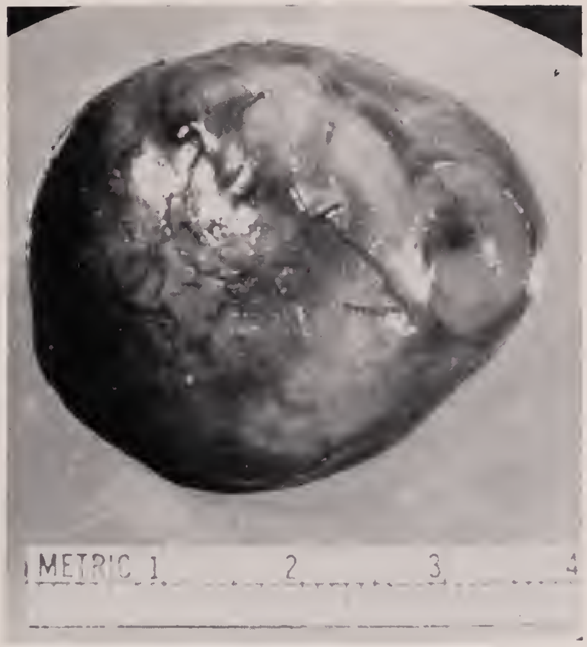


Fig. 3. Pheochromocytoma, gross appearance.

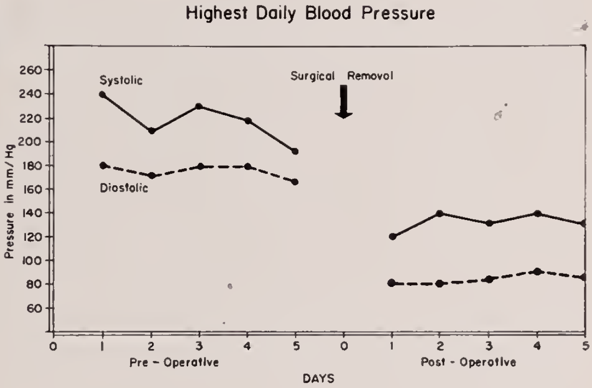


Fig. 4. Comparison of blood pressure, preoperative and postoperative levels.

The pharmacologic tests which are so valuable in diagnosis of pheochromocytoma have been developed during the past decade.[6,7,8] Two types of drugs may be used. Those which elevate the blood pressure are given to reproduce the patients' attacks, and those which act as adrenolytic agents are given to obtain an abrupt lowering of the hypertension when due to a tumor. It is the opinion of Kvale, Priestly, and Roth,[9] who have reported the largest series of these tumors, that histamine is the most reliable drug for diagnosing pheochromocytoma that causes paroxysmal hypertension, and phentolamine (regitine) and benzodioxane (benodaine) are the most valuable diagnostic agents in pheochromocytoma with sustained hypertension.[9]

Once the diagnosis is made, the treatment is surgical removal. Although the tumor may arise in any area where chromaffin tissue is present, nearly 90 per cent of the hypertensive cases occur in the adrenal medulla. About one-fifth of such cases are bilateral or multiple.[10] Because of the high incidence of bilateral tumors, elaborate diagnostic attempts to localize an adrenal tumor have little to commend them. A transverse upper abdominal incision allows the best access to the potential tumor sites. The tumor should be manipulated or compressed as little as possible; the adrenolytic agent, regitine, should be used to combat blood pressure elevation; hypotension following removal of the tumor must be corrected with the use of the pressor drug, Levophed. Postoperatively the systolic pressure should be maintained over 100 mm. by regulating the rate of flow of a constant intravenous solution of 5 per cent glucose in water containing this drug. The patient may require Levophed in such a manner for several days. It is interesting to note that the severity of the clinical symptoms may have no correlation with the size of the tumor.

Summary

This report presents the clinical course an management of a seven-year-old girl with a adrenal pheochromocytoma. Following operativ removal of the tumor, her symptoms and hypertension have been relieved.

We wish to thank Dr. Robert Wilder and his associat for their valuable aid and co-operation in the management of this patient.

References

1. L'abbe. M.; Tinel, J., and Doumer: Crisis solaire et hepertension paroxystique en rapport avec un tumeur surrenals. Bull. et mem. Soc. Med. D hop. de Par., 46:982. 1922.
2. Mayo. C. A.: Paroxysmal hypertension with tumo of retroperitoneal nerve: report of case. J.A.M.A 89:1047, 1927.
3. Daeschner, C. W.: Moyer, J. H., and Able, L. W. Pheochromocytoma in a four-year-old child. J Pediat., 45:141, 1954.
4. Snyder. C. H., and Rutledge. L. J.: Pheochromo cytoma—localization by aortography. Pediatrics. 15 312, 1955.
5. Smid. A. C., and DuShane. J. W.: Pheochromocy toma in children. Am. J. Dis. Child., 90:81, 1955
6. Roth, G. M., and Kvale, W. F.: A tentative test fo pheochromocytoma. Am. J. M. Sc., 210:653. 1945
7. Gifford, R. W., Jr.; Roth. G. M., and Kvale W. F.: Evaluation of new adrenolytic drug (regi tine) as test for pheochromocytoma. J.A.M.A., 149. 1628. 1952.
8. Goldenberg, M.: Snyder, C. H., and Aranow, H. Jr.: New test for hypertension due to circulatin epinephrine. J.A.M.A., 135:971. 1947.
9. Kvale. W. F.: Priestley, J. T., and Roth. G. M.: Pheochromocytoma. Arch. Surg., 68:769, 1954.
10. Smithivick. R. H.: Greer, W. E. R.; Robertson C. W., and Wilkins, R. E.: Pheochromocytoma: A discussion of symptoms, signs and procedures o diagnostic value. New England J. Med., 242:25 1950.

HEMATOMA OF THE RECTUS ABDOMINIS MUSCLE

(Continued from Page 219)

Treatment

This condition has been successfully treated both by conservative measures such as ice bags, bed rest and sedatives and by operative means. My patient received both. If operation is resorted to, the shorter the delay the better the results.

Summary

Attention is called to the rarity of hematoma o the abdominis rectus muscle. The anatom mechanics and functions of the parts involve are reviewed. A case is presented along with i treatment.

Continuation Studies

GROWTH HORMONE

B. J. KENNEDY, M.D.
Minneapolis, Minnesota

THE phenomenon of growth is dependent upon a multitude of interlacing factors, among hich hormonal regulation plays an important ole. Two phases of growth under hormonal conrol appear in the human subject. The first phase. repubertal growth, is largely under the regulaion of the pituitary growth hormone and has its ost rapid spurt during the first few months of fe with a gradual decrease in rate until puberty. rowth hormone has no effect on epiphyseal usion.

The second phase of growth begins at the onset f puberty and is attributed to the steroid horones derived from the gonads and adrenal ortex. In response to production of pituitary onadotropic hormones, the male and female onads, as well as the adrenal cortex, produce eroids that stimulate growth of bone and soft ssues. This stimulation results in skeletal maturaon and eventual closure of the epiphyses.

The serum inorganic phosphorus is elevated in e prepubertal age and appears to be an index f growth hormone production or activity. A fall inorganic phosphorus occurs during puberty. his decrease is probably the result of inhibition f pituitary growth hormone production by the eroid hormones.

Deviations from the normal growth pattern ccur when there is a decrease in or excessive roduction of pituitary growth hormone. Lack of fficient growth hormone results in the syndrome pituitary dwarfism. The decreased production ay result from pituitary hypoplasia or pituitary struction. In the majority of cases there is ually an associated hypogonadism as the result the lack of pituitary gonadotropin production.

Excessive production of pituitary growth hormone as the result of tumor or hyperplasia of the eosinophilic cells of the anterior pituitary results in the syndromes of gigantism or acromegaly. In gigantism excessive production of growth hormone occurs prior to the closure of the epiphyses and coincides with the normal prepubertal growth period. There is a proportional type of growth; abdominal viscera are large but not out of proportion to the rest of the skeleton. In acromegaly the overproduction of growth hormone occurs after epiphyseal closure. There is increased thickness of the entire skeleton and increase in total mass of soft tissues as well, without an increase in linear growth. The paranasal sinuses become enlarged and all cartilages calcify.

The serum inorganic phosphorus is elevated in almost all active acromegalic patients. The serum phosphorus can be depressed when either androgen or estrogen is administered and remains at lower or normal levels so long as steroid hormone is administered. This depression of serum phosphorus is usually associated with evidence of clinical improvement of the acromegalic state.[1] It appears that serum phosphorus is an index of pituitary growth hormone production; and androgenic and estrogenic hormones inhibit the production of pituitary growth hormone by the anterior pituitary and/or inhibit the peripheral effects of pituitary growth hormone.

The growth promoting properties of anterior pituitary extracts have been demonstrated for thirty-five years. More recently chemical procedures have been developed for obtaining crystallized growth hormone of varying degrees of purity which have been employed in biological investigations. Though a mass of literature has accumulated on the effects of growth hormone in animals, the data regarding human subjects is meager and contradictory. Extensive studies in animals have revealed not only the growth pro-

---

Presented at the Continuation Course in Pediatrics r Pediatricians at the University of Minnesota, Sepmber 22, 1955.

Dr. Kennedy is Assistant Professor of Medicine, Dertment of Medicine, University of Minnesota Medical hool, Minneapolis, Minnesota.

TABLE I. METABOLIC EFFECTS OF GROWTH HORMONE IN ANIMALS

1. Promotion of growth of skeleton and soft tissues.
*2. Increased nitrogen retention.
*3. Increased calcium retention.
*4. Increased phosphorus retention.
5. Elevation of serum inorganic phosphorus.
6. Elevation of serum alkaline phosphatase.
*7. Glycosuria.
*8. Impaired glucose tolerance.
*9. Increased insulin resistance.
10. Decrease in blood amino acids.
11. Increase in fasting ketone bodies.
12. Fat mobilization and decrease in body fat.
13. Increase of various enzymatic reactions.
14. Increase of glomerular filtration rate and renal plasma flow.
15. Galactopoietic effect.
16. Maintenance of muscle glycogen in hypophysectomized rats.
*17. Increase in rate of tumor growth of breast and prostate cancer (in man only).

*Effects demonstrated in man.

moting properties of this hormone, but its influence on a wide variety of metabolic processes[2] (Table I). Among these are an elevation of serum inorganic phosphorus and alkaline phosphatase, and increased retention of calcium, phosphorus and nitrogen. Convincing evidence is available that growth hormone increases the anabolism and decreases the catabolism of protein. The fundamental mechanism by which the hormone promotes the formation of body protein and spares protein stores during fasting is unknown.

An anti-insulin effect on carbohydrate metabolism has been demonstrated. This resulted in reversible or permanent glycosuria, reversible or permanently impaired glucose tolerance, and increased insulin resistance. The mechanism of this action is unknown. There appears to be an antagonism between insulin and growth hormone, possibly exerted on the enzyme hexokinase in the process of glucose phosphorylation. Whether growth hormone and diabetogenic hormone are the same or separate factors has not been clearly defined.

If the primary action of growth hormone is to decrease protein catabolism, more fat would be mobilized and utilized as an energy source. The hormone is capable of mobilizing body fat, produces ketonemia in fasting rats and decreases the total body fat. It appears unnecessary to postulate the existence of a specific ketogenic hormone in view of these effects on fat metabolism.[3]

Other metabolic effects consist of a decrease in blood amino acids, maintenance of muscle glycogen in hypophysectomized rats, increase in glomerular filtration rate and renal plasma flow, and enhancement of various enzymatic reactions. Little evidence has been gained, however, indicating the mechanisms by which these effects are produced.

The role of growth hormone in mamma development has been described.[4] In hypoph sectomized, oophorectomized virgin rats, mamma development simulating early pregnancy was i duced by injecting estrone, progesterone an lactogenic hormone. When growth hormone w injected, as well as these other hormones, comple lobulo-alveolar development similar to late pre nancy was induced. Lactation would occur ACTH or cortisone were also administered. I cows the administration of growth hormone caus significant increases in milk yield (galactopoiet effect).[5] The effect of growth hormone in man mary gland physiology appears well established.

The evidence for the action of administer growth hormone or somatotropin in man is scan The available data are contradictory as to wheth growth hormone can achieve protein anabol effects or influence carbohydrate metabolism, well as to reproduce metabolic processes describ in animals. The conflicting data is primarily t result of the lack of an adequately prepared pu preparation of growth hormone in sufficie amounts for clinical investigation. The di crepancies in data appear to be due to contamin tion of the hormone with thyrotropin or ACT loss of activity in handling the preparation, other problems related to its chemical preparatio The responsiveness to the hormone might also conditioned by the metabolic status of the subje treated. More recently the development of a anti-growth hormone factor has been postulate as an explanation for the lack of consistent i vestigations.[6]

Extensive metabolic studies have been carrie out in the human.[7-9] From these investigations is possible to draw some conclusions as to t action of somatotropin in human subject Crystalline somatotropin is capable of bringi about many of the major metabolic effec characteristic of this hormone in animals. The is enhancement of the storage of nitrogen, calciu and phosphorus requisite for the growth skeleton and soft tissues. Impairment in carb hydrate metabolism has been manifested by t development of a diabetic type of gluco tolerance curve, increased insulin resistance an glycosuria. All of these alterations were reversib No consistent changes have been observed in t serum inorganic phosphorus or alkaline phosph tase. Though an increase in height and weig of human subjects of short stature has occurr uring administration of growth hormone, the ata is too meager to permit any conclusions as o the efficacy of growth hormone in the therapy f pituitary dwarfism or children of short stature.

The pituitary gland is increasingly important n the control of the growth rate of certain alignancies. The improvements in advanced reast and prostate cancer as the result of the dministration of estrogens and androgens have een postulated to be the result of pituitary gland ppression, or a "chemical hypophysectomy." The dministration of growth hormone to a woman ith breast cancer previously hypophysectomized nduced osteolysis as measured by an increase in rinary calcium excretion.[10] This osteolysis is terpreted as due to an increased rate of tumor rowth. Growth hormone administered to a atient with metastatic prostate cancer resulted increased pain, increase in serum acid phoshatase, and increase in urinary calcium excretion Table II). Cessation of therapy was followed y a reversal of these changes. It was to be pected that total surgical hypophysectomy would employed in the management of advanced ncer of the breast and prostate. Numerous reorts to date[11,12] demonstrate that in selected atients striking regressions of metastatic tumors ave occurred as a result of surgical hypophectomy. The improvements noted are in part e result of deprivation of growth hormone.

The procedure of surgical hypophysectomy has so been employed in an attempt to control vere diabetes mellitus and forestall the development of secondary complications of this disease. view of the role of growth hormone in carbodrate metabolism, it is not unexpected to find decrease in insulin requirements and a decrease hyperglycemia and glycosuria following hypophectomy. The early investigative experience in is disease suggests that improvement in some lvanced vascular lesions can also be expected. hese studies demonstrate that the regulation of abetes mellitus by insulin and diet are not the ly factors involved in the control of this disease. rther research is being directed toward the tuitary factors.

Summary

Growth hormone affects fundamental metabolic ocesses of protein, carbohydrates, fats, minerals d various enzyme systems. With the development of purer hormonal preparations, the role of growth hormone in malignant diseases, diabetes mellitus and normal growth can be more clearly elucidated.

TABLE II. EFFECT OF GROWTH HORMONE ON PROSTATIC CARCINOMA

3-day Period	Growth Hormone mg./day	Urine Calcium mg./day	Serum Acid Phosphatase K.A. Units
1		162	13.3
2		166	16.2
3		152	
4	100	215	17.2
5	200	217	
6		287	19.1
7			13.5

References

1. Kinsell, L. W.: Hormonal regulation of human growth. Protein Metabolism, Hormones and Growth. New Brunswick, New Jersey: Rutgers University Press, 1953, p. 62-80.
2. Li, C. H.: Growth and adrenocorticotropic hormones of anterior pituitary. The Harvey Lectures. Springfield, Illinois: Charles C Thomas, 1950-1951, p. 181.
3. Goodman, L. S., and Gilman, H.. The Pharmacological Basis of Therapeutics. New York: Macmillan Company, 1955, p. 1574-1575.
4. Lyons, W. R.; Johnson, R. E.; Cole, R. D., and Li, C. H.: Mammary growth and lactation in male rats. The Hypophyseal Growth Hormone, Nature and Actions. New York: McGraw-Hill Book Company, Inc., 1955, p. 461-472.
5. Folley, S. J.: Effects of somatotropin and other pituitary hormones on the lactating mammary gland. The Hypophyseal Growth Hormone, Nature and Actions. New York: McGraw-Hill Book Company, Inc., 1955, p. 473-485.
6. Kennedy, B. J., and Good, R.: Unpublished data.
7. Shorr, E.; Carter, A. C.; Smith, R. W.; Kennedy, B. J.; Havel, R. J.; Roberts, T. N.; Sonkin, L. L., and Livingstone, E. T.: Metabolic studies of the action of growth hormone (somatotropin) in man. The Hypophyseal Growth Hormone, Nature and Actions. New York: McGraw-Hill Book Company, Inc., 1955, p. 522-551.
8. Shorr, E.; Carter, A. C.; Kennedy, B. J., and Smith, R. W.: Metabolic studies on the effects of crystalline growth hormone (somatotropin) in man. Tr. Assoc. Am. Phys., 66:114, 1953.
9. Kinsell, L. W.: Human studies with purified pituitary growth hormone preparations. The Hypophyseal Growth Hormone, Nature and Actions. New York: McGraw-Hill Book Company, Inc., 1955, p. 507-521.
10. Pearson, O. H.: Discussion. The Hypophyseal Growth Hormone, Nature and Actions. New York: McGraw-Hill Book Company, Inc., 1955, p. 497-498.
11. Luft, R., and Olivecrona, H.: Hypophysectomy in man, Experiences in metastatic cancer of the breast. Cancer, 8:261-270, 1955.
12. Kennedy, B. J.; Peyton, W. T., and French, L. A.: Total hypophysectomy in advanced breast cancer. Bull. Univ. Minnesota Hosp., 26:528-551, 1955.

Laboratory Aids

Sponsored by
The Minnesota Societ
of Clinical Pathologis
George G. Stilwell, Edit

DIFFERENTIAL DIAGNOSIS OF LYMPHOCYTOSIS AND LEUKEMIA

R. DOROTHY SUNDBERG, Ph.D., M.
Minneapolis, Minneso

Lymphocytosis

Lymphocytosis occurs in a wide variety of conditions. Differential diagnosis ultimately depends upon qualitative changes in lymphocytes, but knowledge of the scope of the diagnostic possibilities is useful. Briefly, the following principles can be defined.

Infants from two weeks to two years of age generally show a normal "lymphocytosis," and they may respond to infections with minimal lymphocytosis rather than neutrophilia. A source of concern is the fact that their large lymphocytes may contain visible nucleoli. These are not of diagnostic importance.

Viral and other diseases associated with a tendency toward leukopenia often show a relative lymphocytosis. Lymphocytes may show leukotoid alterations comparable to those of infectious mononucleosis. This fact makes it difficult to diagnose with security the leukopenic phase of infectious monoucleosis.

In infants and young children, extremely high lymphocyte counts occur in two conditions other than leukemia. One, namely, infectious lymphocytosis, is characterized by a monotonous increase in the number of mature small lymphocytes. The lymphocytosis persists from three to seven weeks; as the percentage of lymphocytes decreases, the percentage of eosinophils increases. Rarely, the predominant lymphocyte is a medium-sized cell. The bone marrow may show a similar lymphocytosis, with 40 to 45 per cent lymphocytes. The second condition, namely, pertussis, shows a lymphocytosis comprised of cells that are more variable in size and morphologic structure. A few lymphocytes show leukocytoid alterations and a few may be immature, but most are norm lymphocytes, and the variability in the morph logic aspects of the cells does not approach th of infectious mononucleosis. When the tot leukocyte count is less than 65,000 cells per cub millimeter, infectious mononucleosis becomes i portant in differential diagnosis.

Leukemia

General findings in lymphatic leukemia a simpler to delineate than are those in benig lymphocytosis.

Chronic lymphatic leukemia, a disease adults, is characterized by a monotonous increa in mature lymphocytes of similar size and stru ture. Total counts vary from the normal range more than 1,000,000, with very high percentag of lymphocytes, but symptoms and signs need n vary accordingly. Immature lymphocytes are n prominent, but many smudged or damage lymphocytes are found in either blood or bo marrow. Lymphoblasts are almost never seen. Th cells resembling blasts are reticular lymphocyt comparable to those of infectious mononucleosis benign hyperplastic nodes. Biopsy of the bo marrow is helpful in diagnosis. Here, too, th monotonous picture of lymphocytosis exist lymphocytes vary from 20 to 90 per cent, wit an average of 60 per cent. If the relative an absolute numbers of lymphocytes are low in bot blood and marrow, sections of the aspirate marrow often are needed to establish the diagnosi

The various forms of subacute and acut lymphatic leukemia offer the most confusion b cause they are common in infants, children, an young adults, the same age range in which i fectious mononucleosis also is most common. anemia and thrombocytopenia have not yet beco profound, the clinical findings in these leukemi may mimic those of infectious mononucleosis. Th extreme malaise, the hyperpyrexia, and the natu

---

From the Departments of Anatomy and Special Hematology, University of Minnesota Medical School.

This is the thirty-seventh in a series of editorial reports sponsored by the Minnesota Society of Clinical Pathologists and designed to foster closer relationships between laboratory physicians and their colleagues.

f the pharyngitis in infectious mononucleosis ften make the patient who has infectious mononucleosis seem a much more likely candidate for mminent death than the patient with acute eukemia. Total leukocyte counts in subacute or cute lymphatic leukemia vary from leukopenic evels to considerably more than 200,000. Cells f the lymphocytic series dominate the differential ount. The general appearance of these cells is nonotonous insofar as similarity in size is con- erned. Lymphoblasts, immature lymphocytes nd mature lymphocytes are present. Acute ukemias have 60 per cent or more lymphoblasts; ubacute leukemias have less than 60 per cent mphoblasts. The lymphoblast is the cell that is ssential to the diagnosis of acute and subacute mphatic leukemia. It is abnormal in the eripheral blood and lymph nodes; it is not resent in benign lymphocytoses. The immature mphocyte, a cell that resembles the lymphoblast n size and paucity of cytoplasm but that rdinarily lacks nucleoli, occurs in large numbers n the acute and subacute lymphatic leukemias; is also found in normal lymph nodes and bone narrow and, occasionally, in normal blood as ell as in lymphocytoses. The similarity of the nmature lymphocyte to the lymphoblast is sponsible for much confusion in differential iagnosis. The bone marrow in either acute or ıbacute lymphatic leukemia contains high per- entages of lymphoblasts, immature lymphocytes nd mature lymphocytes, the average being 95 er cent. Study of bone marrow is particularly seful in diagnosis in the cases with normal or ukopenic peripheral leukocyte counts.

nfectious Mononucleosis—Lymphatic Reaction

The lymphocytosis of infectious mononucleosis robably remains confusing because no two cases e alike. The combination of the clinical findings d numerous lymphocytes with large amounts of ue cytoplasm and nuclei that occasionally have sible nucleoli is often alarming. Several features serve emphasis. Anemia and thrombocytopenia e generally absent. The leukocyte count may ry from 2,000 to 65,000 but the usual values e between 8,000 and 25,000. Percentages of mphocytes range from 25 to 85, but diagnosis difficult if the percentage is less than 50. Of utmost importance is the variation in size and structure; there is no monotony in the lymphocytic picture. Often the largest and bluest cells in the blood film contain nucleoli and resemble some blast form. These, the reticular lymphocytes (type III, Downey), are normal precursors of lymphocytes. They generally comprise only a small percentage of the lymphocytes. The majority of the lymphocytes show leukocytoid changes. Downey's type II or type I leukocytoid lymphocytes or both are present, and otherwise normal-appearing lymphocytes may have excessive azurophilic granulation or cytoplasmic basophilia. Occasional plasma cells are also seen. Because the fragile cytoplasm of the type II lymphocytes is often distorted, these cells may assume polygonal shapes. Often there is an absolute as well as a relative neutropenia, and occasional neutrophilic promyelocytes and myelocytes are found. Bone-marrow biopsy is not necessary for diagnostic purposes in most cases. Percentages of lymphocytes in the marrow range from 12 to 43, with an average of 25; about half of the lymphocytes in the marrow show leukocytoid changes, and evidence of formation of these cells in the marrow is present. About 40 per cent of the sections of aspirated marrow in infectious mononucleosis show small granulomatous lesions as well as foci of developing lymphocytes.

When high percentages of lymphocytes show leukocytoid changes, the condition is called a "lymphatic reaction." The changes in individual lymphocytes are comparable to toxic changes in neutrophils, and also they generally indicate stimulation of lymphatic tissue. Unless the lymphatic reaction is of considerable magnitude, its diagnostic importance is questionable. Lymphatic reactions can occur in infectious mononucleosis, brucellosis, infectious hepatitis, German measles, serum sickness, sepsis, viral diseases and agranulocytosis, and with eosinophilia. Plasma cells may also be present in any of these conditions. High percentages of plasma cells are seen in German measles, hepatitis and serum sickness. A blood picture indistinguishable from that of infectious mononucleosis is seen in very occasional cases of brucellosis and infectious hepatitis, so it should be remembered that morphologic studies alone will not exclude the latter conditions.

Current Concepts

THE PRESENT STATUS OF THE TREATMENT OF VARICOSE VEINS

DAVITT A. FELDER, M.D
Saint Paul, Minnesot

The existence of different types of treatment for a disease makes it seem likely that none is completely satisfactory. This appears to be true of varicosis of the veins of the lower extremities.

There has been some progress made in the past few years, both in an improved understanding of the etiology as well as in the treatment of superficial varicosis of the lower extremities. Aside from inherent structural weakness, degeneration with age or trauma secondary to over-distention (as a result of deep vein obstruction) and hormonal changes, there is an increasing interest of late in the rôle of arteriovenous connections as an abetting factor in the development of varicoses. It is reasonable to assume that elements of more than one etiological factor may be responsible and at times in the same patient.

In a dilated vein, the valves cannot function efficiently. Approximation of the vein walls to one another by pressure from without is the basis for restoration of valve function and resolution and control of signs and symptoms. Elastic bandages or stockings are therefore still acceptable and popular forms of treatment. When the valve structures are destroyed or for some reason treatment with elastic support alone is unsuccessful, then functional or anatomical elimination of the incompetent and inefficient veins is indicated.

At the present time, ligation and intraluminal stripping are the most popular methods of treatment. The results are gratifying, especially in regard to the removal of some large superficial saphenous veins.

There is no doubt that by this technique one removes some of the diseased veins. On the other hand, there seem to be at least two misconceptions associated with this form of treatment. One is that the connections with the perforating or communicating veins are disrupted. This is anatomically unlikely in most instances. The superficial veins often connect with the perforating or communicating veins by numerous and devious channels. The direct connections so often shown i simplified diagrams between the saphenous itsel and the deep veins are actually infrequent. Another is that stripping gives an outstandingly bette end result as far as future varices is concerned. I this author's opinion, it still remains to be prove that the results of stripping are appreciably bette in all or even most instances than with adequat high and serial ligations. The enlarged long o short saphenous veins often become indiscernibl within eight months after high ligation. It is tru that the extremely tortuous, dilated varicositie will tend to persist after high ligation alone. Bu these are also the varicosities that are almost impossible to strip out.

There is no comparison between the morbidit of simple and serial ligations to that followin stripping. It would not be surprising to see th procedure of vein stripping gradually lose popularity in favor of a return to simple high and seria ligations. With an adequate high ligation at th sapheno-femoral junction, the results after eigh months, in this author's series, are very gratifyin and appear to be comparable to those in patient with vein stripping.

The procedure of high ligation with retrograd injection, previously and still championed by McPheeters,[1] is now infrequently done. As shown b Wright, et al,[2] the sclerosing agent goes almost entirely into the deep veins. Here it can and probably does cause an appreciable amount of damag to valves and endothelium.

Abraham[3] has recently described the method o high ligation and the insertion of a silk suture int the distal vein to obliterate it. We have evaluate his technique, using both silk and catgut, and hav found it to have about the same postoperativ morbidity as vein stripping.[4] However, the actua rauma and blood loss were much less than with he stripping technique. It has another advantage that it can be done under local anesthesia.

Superficial varices remaining eight months after ny of the above procedures are best obliterated y the airfoam injection technique described by Ieyers of the Mayo Clinic.[5] A small amount of lerosing solution (we use 3 per cent sodium sotra- ecal*) is mixed with about three times as much r to make a foam. This foam is injected into the in with the patient in the reclining position. The r foam gives a great deal of endothelial contact ithout the presence of much blood. This leads to sclerosis without a large thrombus and thus a ner and incidentally less painful end result.

The surgical treatment of varices during preg- ncy can be accomplished without any greater orbidity than in nonpregnant individuals.[6] There some risk nonetheless. The fact that such veins turn to normal in most individuals within eight onths after parturition, makes surgical treatment nnecessary in such instances. With succeeding egnancies, the unresolved disease tends to in- ease. When such disease is symptomatic after ght months postpartum, then we believe surgery indicated. Occasionally the discomfort is so great d the nature of the vessels an actual hazard, that such instances surgical treatment during preg- ncy is indicated.

The hormone treatment of symptomatic vari- sis in pregnancy, as proposed originally by Mc- sland,[7] has not gained widespread popularity. owever, other authors have reported good results th this method[8] and McPheeters is still using it.

For the most part, conservative treatment, in- ding elevation of the foot of the bed, good stic support when up, avoidance of prolonged ting and prolonged standing and daily walks are is author's method of choice for the treatment the varicosities of pregnancy.

Ligation of the superficial femoral vein, as commended originally by Buxton, et al,[9] while ll done for the stasis syndrome is not very popu- . In the individual whose activities do not de- nd rapid or persistent walking, deep vein liga- n may still have a place and can be expected give some relief.

Popliteal vein ligation, popularized by Bauer[10] s fallen by the wayside. It is interesting that my league. Dr. Thomas O. Murphy, in thirty-two phlebographic studies on patients who had had popliteal vein ligations for the stasis syndrome found a popliteal vein of appreciable size visualized in all.[11] Either these patients had only one of two popliteal veins ligated or else a smaller collateral became dilated as a result of the popliteal occlusion. Most of the patients in our clinics who have had popliteal vein ligations for the stasis syndrome have returned with their old symptoms within one year.

The recent advances in phlebographic methods[12,13] have brought with them the documentation of varicosis of the deep and communicating veins in limbs presenting the stasis syndrome. They have also established the fact that in the postphlebitic limb the deep veins are usually patent although incompetent. This makes treatment by ligation, removal or obliteration of incompetent superficial veins a reasonable procedure in such limbs, whereas it was formerly thought to be an extremely hazardous undertaking.

These phlebographic studies have also brought out other possible etiological factors in the production of the stasis effect in the lower extremities. These techniques have resulted, in our experience, in a better control of surgical procedures for the ligation of communicating or perforating veins.[14] One can hope that these and improved methods of visualization of the deep veins will lead to further and better methods of treatment of the disorders of the veins of the lower extremities.

References

1. McPheeters, H. O.: Sapheno-femoral ligation with immediate retrograde injection. Surg., Gynec., & Obst., 81:355-364, 1945.
2. Wright, A. D.; Kinmonth, J. B., and Boyd, A. M.: Discussion on primary treatment of varicose veins. Proc. Roy. Soc. Med., 41:631, 1948.
3. Abraham, A. J.: A new method of causing thrombosis in varicose veins. Brit. M. J. 2:260-262, 1952.
4. Murphy, T. O.; Felder, D. A., and Casey, J.: The use of an intraluminal suture in the obliteration of incompetent varicose veins. AMA Arch. Surgery, 72:149-152 (Jan.) 1956.
5. Myers, T.: Sclerosis of veins. Pp. 779. In Peripheral Vascular Disease by Allen Barker and Hines. Philadelphia: W. B. Saunders Co., 1955.
6. Quattlebaum, F. W., and Hodgson, J. E.: The surgical treatment of varicose veins in pregnancy. Surg., Gynec., & Obst., 95:336-340, 1952.
7. McCausland, A. M.: The influence of hormones upon varicose veins in pregnancy. Western J. Surg., 51:199-200, 1943.
8. McPheeters, H. O.: The value of estrogen therapy in the treatment of varicose veins complicating pregnancy. Journal-Lancet, 69:2-4, 1949.

(Continued on Page 260)

---

*Wallace and Tiernan

Clinical-Pathological Conference

Sponsored by
The Minnesota Sociei
of Clinical Pathologis
Donald F. Gleason, Edit

CASE PRESENTATION

WYMAN JACOBSON, M.I
and RALPH SMITH, M.I

Minneapolis, Minneso

A FORTY-ONE-YEAR-OLD clerk was admitted April 1 complaining of epigastric pain for one month. For nine years he had suffered from periodic episodes of epigastric distress, usually in the spring and in the fall. He had been examined roentgenographically on several occasions and told that there was no evidence of peptic ulcer and that he had a "nervous stomach." He had experienced no severe distress until the past month, during which time he had sharp pain across the epigastrium. The pain did not radiate; it was severe and frequently awakened him at night. Gelusil and milk accorded much relief. He vomited occasionally, which seemed to relieve him. He had noted no hematemesis nor celena. He had lost about 15 pounds in weight.

He had used alcoholic beverages freely for a few years but very little in the past eleven years. He had been treated for syphilis twelve years ago and was retreated several years later.

He was well developed, thin and in no acute distress. The temperature was 99.4° F., the pulse rate 82, the blood pressure 124 mm. of Hg systolic and 82 diastolic. The heart and lungs were normal to percussion and auscultation. There was slight epigastric tenderness and a succussion splash was heard over the stomach.

The hemoglobin was 13.5 gm. per 100 cc., the leukocyte count 15,700 (73 per cent neutrophils, 23 per cent lymphocytes, 2 per cent monocytes, 1 per cent eosinophils, 1 per cent basophils), the sedimentation rate was 50 mm. in one hour. The blood urea nitrogen was 13.5 mg. per 100 cc., the chlorides 92.7 mEq./1., Co_2 30.2 mEq./1., and potassium 4.5 mEq/1. Total serum protein was 6.8 gm. per 100 cc. (albumin 5, globulin 1.8). The urine specific gravity was 1.028, negative for albumin, faint trace of sugar, sediment contained 1 to 2 leukocytes per high power field. Fasting blood sugar was 91 mg. per 100 cc. The stool was negative for occult blood. The VDRL slide test was negative. Gastric analysis showed 52 units of free acid, 78 units of total acid. The serum amylase was 80 units. The serum bilirubin was 0.2 mg. per 100 cc. at one minute, the total being 1.0 mg. per 100 cc. There was 1.8 per cent retention of bromsulphalein at forty-five minutes, prothrombin was 84 per cent, cephalin flocculation negative, thymol turbidity 6 units.

A PA film of the chest was normal. An upper gastrointestinal series revealed a large penetrating ulcer of the antrum or of the first portion of the duodenum with obstruction to the outflow of barium.

He improved on continuous gastric suction and parenteral alimentation. However, he was unable to tolerate an ulcer No. 1 regime on several occasions when he had repeated vomiting and bedtime gastric aspirat measured 1500 cc. On April 8 a transfusion was di continued because of a generalized erythematous erup tion. Plasma hemoglobin and blood culture we negative. On April 12 he received 500 cc. of who blood when only slight urticaria was noted.

At operation on April 13 there was a large duoden ulcer penetrating into the head of the pancreas. A gastr resection was done with a Billroth II type of reconstru tion leaving the ulcer bed *in situ*. Procaine penicilli 300,000 units daily was administered, and dihydr streptomycin 500 mg. every six hours was begun. H condition that day remained satisfactory.

The following morning his rectal temperature w 103.5°, pulse rate 96 and blood pressure 70/30 mm. Hg. The hemoglobin was 15.9 gm. per 100 cc., th serum analyase was 135 units. The blood pressur stabilized at 120/78 after administration of 600 cc. plasma and 500 cc. of whole blood. The temperatur remained elevated, and that evening his blood pressur fell to 65/40 mm. of Hg. Intravenous administratio of vasoxyl was instituted and the blood pressure range about 102/56 mm. of Hg. An indwelling catheter wa introduced because of retention. Urine output wa satisfactory.

The second day following surgery his rectal tempera ture ranged from 103.5° to 106° F. Administration vasoxyl was continued and the blood pressure range between 70/50 and 110/60 mm. of Hg. The abdome was soft, there was no unusual tenderness, few bow sounds were heard. Urine output was adequate. Th hemoglobin was 14.7 gm. for 100 cc., the leukocyt count 4,700 per cu. mm. with 72 per cent neutrophil and 28 per cent lymphocytes. The serum amylase wa 60 units. Multiple films of the chest were negative Flat and lateral decubitus film of the abdomen showe gas in the large and small bowel and some mottlin over the upper quadrant. He received 300 cc. o plasma. Intravenous administration of terramycin 25 mg. every six hours was added to his therapeutic pro gram. His urinary output remained adequate. Th urine specific gravity was 1.023, albumin 3+, a trac of sugar, the sediment contained a full field of leuko cytes and 70 to 75 erythrocytes per high power field.

On the third postoperative day his condition was un altered. There was some swelling about the lips and generalized erythematous eruption with urticarial wheal which improved upon administration of Benadryl. H received 500 cc. of plasma. The rectal temperature wa 105° F. Levophed was now employed and the bloo pressure ranged from 80/70 to 100/70. He had a larg watery stool which did not appear to contain bloo On this day a second operation was performed.

Discussion

Dr. W. E. Jacobson: The protocol in this case su plies us with an abundance of information to substantiat the diagnosis of a large penetrating duodenal ulcer an

---

Presented at the Hennepin County Medical Society meeting, February 7, 1955.

Sponsored by the Minnesota Society of Clinical Pathologists.

Dr. Jackson is from the St. Louis Park Medical Center, and Dr. Smith is from the Veterans Administration Hospital.

leaves no doubt as to the wisdom of having advised surgical therapy for this patient's original disease. The preoperative information otherwise merely defines a relatively normal forty-one-year-old man. There was moderate hypochloremia and mild alkalosis probably related to the high degree of pyloric obstruction with vomiting. For reasons that are not well described he received blood preoperatively even though the hemoglobin is recorded as 13.5 grams per 100 cc. The ransfusion was complicated by what seems to have been an allergic transfusion reaction. There is nothing indicate that this was a hemolytic transfusion reaction.

The major problem began twenty-four hours postperatively and was manifested in the simplest analysis y the development of hypotensive shock and fever. The ifferential diagnosis must therefore include all postperative complications capable of producing rather severe shock and significant fever. The postoperative omplications must include diseases which might develop oincidental to the postoperative period and yet not be irectly related to the operation itself. In attempting o unravel this problem, I have elected to consider the arious causes of shock. The first obstacle to this aproach lies in the fact that there is no clear-cut classifiation of shock. From a purely physiological, pathological spect, all cases of shock are characterized by oligemia. y reduced peripheral resistance or by both. Therefore, is necessary to consider the causes of shock from a urely clinical standpoint. I have chosen five major nditions which could be the cause of shock. These re (1) hemorrhage, (2) administration of fluids or rugs, (3) operative complications, (4) overwhelming nfection, and (5) other medical diseases or complicaons. Although there might be disagreement and dispproval as to this classification there would certainly e complete unanimity of opinion relative to the imediate need for determining whether the shock was condary to hemorrhage. According to the work of merson and Ebert[1] during the second World War, is apparent that approximately 40 per cent of the ood volume must be lost in order to produce acute emorrhagic shock. It is obvious from this protocol, cluding the data relative to the patient's fluid reacement and the multiple recordings of hemoglobin er several days, that he did not lose any large amounts blood either at the operation on in the postoperative riod. Therefore, I believe that we can immediately smiss the factor of hemorrhage as producing the shock d complications noted in this patient.

I will turn next to the question of shock secondary the administration of drugs and fluids. Drugs are pable of producing shock as a result of one of three ctors, namely, (1) a primary hypotensive effect of e drugs, (2) the production of an acute anaphylactic action, and (3) the production of a delayed hypernsitivity reaction of the serum sickness type. Hexathonium and related drugs are common examples of bstances capable of producing marked hypotension and ock. This patient did not receive any drugs dinarily considered markedly hypotensive in their ect. The matter of acute anaphylaxis also seems extremely unlikely. The patient's reaction was delayed at least twenty-four hours, and also he maintained an adequate urine output during his entire postoperative course. Delayed hypersensitivity reactions of the serum sickness type, a common example of which is the penicillin reaction, is most frequently manifested by the delayed development of urticarial skin lesions, fever, arthritis and often gastrointestinal symptoms. Although shock is not a common manifestation of the delayed hypersensitivity reaction it may occur and I can recall one patient with profound collapse occurring during a severe penicillin reaction. There are, however, numerous reasons for excluding the hypersensitivity reaction of this type as the cause of this patient's postoperative manifestations.

The administration of fluids including blood may produce shock as a result of the infusion of potent pyrogens, as a result of bacterial contamination of the fluid or as a result of a hemolytic reaction. I will discuss the matter of bacterial contamination subsequently but at this time would believe that we could exclude either a severe pyrogenic reaction or a hemolytic transfusion reaction. The maintenance of an adequate urine output is the strongest single factor to consider in this regard. Of course, the lack of an elevated plasma hemoglobin further helps to exclude the possibility of a hemolytic transfusion reaction.

I probably would be prudent to omit entirely any discussion relative to postgastrectomy surgical complications capable of producing this picture. This requires a considerable knowledge of the technical aspects of the surgery which I am not at all prepared to discuss. However, I shall mention three things that come to mind, namely, (1) blowout of the duodenal stump, (2) ligation of a major artery at the time of surgery and (3) the development of a closed loop obstruction in the immediate postoperative period. I believe that the factor of time tends to exclude the possibility of a blowout of the duodenal stump. It is my understanding that this complication usually occurs about the fourth to the fifth postoperative day, and that it is relatively uncommon during the first twenty-four hours. The surgeons, I am sure, will object to the insinuation that they might during gastrectomy inadvertently ligate a major artery. However, I have considered three possibilities: (1) the middle colic artery, (2) the left hepatic artery, and (3) the celiac artery. I do not believe that ligation of any of these vessels would produce the picture noted in the postoperative period as recorded in this protocol. I have been told that one may ligate the middle colic artery without the development of arterial insufficiency and gangrene of the bowel. Ligation of the other two vessels might be expected to be more serious but not result in this clinical picture.

The possibility of a closed loop obstruction must however, be more seriously considered. In using the Billroth II operation, I believe it is common custom for the surgeon to place the tip of the gastric tube into the duodenal loop in order to maintain constant drainage and prevent the complication of a closed loop obstruction. It would be well to know at this time whether the gastric drainage in the postoperative period was bile stained.

Dr. Ralph Smith: The drainage was bile stained.

Dr. Jacobson: The presence of bile in the drainage fluid would appear to be the best proof that this was not a closed loop obstruction.

Severe overwhelming infections are not infrequently associated with the development of significant peripheral vascular collapse and shock. Actually the clinical manifestations of fever and shock presented by this patient strongly suggest the possibility of some severe complicating infectious process. A bacteremia usually complicates the infection in circumstances resulting in shock. Among the more common clinical infections capable of producing shock one must include pneumonia with bacteremia, meningococcemia, and urinary tract infections with associated bacteremia. Any of the coliform organisms capable of causing an acute pyelonephritis may result in bacteremia with fulminating shock and high fever. One must also consider the possibility of whether this patient received fluid or blood grossly contaminated with bacterial organisms. As you may already know, there have been reported by local authors at least two cases of acute fulminating shock and high fever associated with the transfusion of contaminated blood. In both of these cases the organism was a Gram-negative bacteria. The clinical picture has been well described by Borden and Hall.[2] The clinical state was one of immediate fever, shock and severe oliguria. This patient did not present this classical picture. I do not believe that there is evidence to suggest that he received contaminated blood; however, I cannot exclude the possibility of some other type of severe infection producing the picture of shock and high fever manifested by this patient.

In the final category I attempted to think of some other medical disease or medical complication capable of producing this syndrome. I considered two possibilities, (1) myocardial infarct and (2) acute pancreatitis. I think that it is wise whenever dealing with the problem of unknown shock to exclude the possibility of an acute silent myocardial infarct. I should like to ask, therefore, whether electrocardiograms were done on this patient during his postoperative period.

Dr. Ralph Smith: There were no electrocardiograms taken.

Dr. Jacobson: The absence of an electrocardiogram makes it more difficult to exclude the possibility of a myocardial infarct; however, I believe that we can rely on the clinical picture. It certainly would be unusual for an acute myocardial infarct to be manifested by fever of 103° to 105°, no pain and intermittent shock. For these reasons I shall eliminate this possibility for purposes of further discussion.

The development of an acute severe hemorrhagic pancreatitis during the postoperative period might adequately explain this patient's entire clinical course. It is known that this patient had a large duodenal ulcer and that preoperatively this had penetrated and probably to some degree had produced an associated pancreatitis. It is not unlikely, therefore, that this process could become acutely worse in the immediate postoperative period and result in a fulminating necrotic hemorrhagic pancreatitis.

The first question that comes to mind is, "How can one make a diagnosis of acute pancreatitis in view of the normal serum amylase?" In the usual case of acute pancreatitis the amylase will rise within the first twenty-four hours and will return to normal within three to ten days. The one exception to this rule is acute hemorrhagic pancreatitis in which there may be a transient rise during the first eight to twelve hours and then the serum amylase rapidly falls to normal and in some cases may fall to abnormally low values. It is not unusual in acute necrotic hemorrhagic pancreatitis to find values less than 50 units in the first twenty-four hours after the onset of the attack. It is well known that the elevation of the amylase is not correlated with either the severity nor the prognosis of acute pancreatitis. The elevation of the amylase in pancreatitis depends upon the release of pancreatic enzymes from the injured tissue into the circulation. If the gland is rapidly and completely destroyed and if there is associated thrombosis of the pancreatic and splenic vessels, it is readily apparent that there will be no release of pancreatic enzyme into the general circulation. On the other hand, cases of moderate necrosis may have high levels and the high levels may remain elevated for weeks after the acute symptoms subside.

The next question challenging this diagnosis is, "How can one make a diagnosis of acute pancreatitis in a man who has a soft abdomen with no unusual tenderness?" My only answer to this question is that this patient obviously has some fulminating intra-abdominal condition, and while it is unlikely in pancreatitis to have a non-tender soft abdomen, it would be equally unlikely in any other situation which I could consider. Furthermore, I have seen one previous patient who following a gastrectomy for carcinoma of the stomach developed a delayed renal shut-down which subsequently resulted in his death. During the entire postoperative period the patient had a soft, non-tender abdomen and yet at autopsy had a rather severe pancreatitis.

There are two studies which might have helped to shed further light on the possibility of this being acute hemorrhagic pancreatitis. First, we would expect in a patient with this complication some degree of peritoneal fluid, although not massive ascites. If some of this can be obtained by needle aspiration the determination of amylase value on the fluid may be extremely helpful in making the diagnosis of hemorrhagic pancreatitis. Even though the blood value may be low, the value in the secretion within the peritoneal cavity may exceed 500 to 1,000 units. Secondly, it is of extreme value to determine the serum calcium. This determination has its greatest value in the diagnosis and prognosis of pancreatitis in cases such as I would expect this to be, namely, acute hemorrhagic pancreatitis with the development of multiple fat necrotic areas throughout the peritoneal cavity. Under such circumstances, the serum calcium almost universally falls rapidly and falls to values of 7 mg. per cent or less. This determination, unlike the serum amylase, is directly related to the severity of the disease and is to some degree related to the prognosis. The lower the serum calcium value, the more likely the patient is to succumb to the acute pancreatitis. There is one other determination which might have been of some value, namely, the determination of the blood sugar level during the postoperative period. In patients with severe pancreatitis moderately severe hyperglycemia may develop.

In conclusion, I should like to state that I have reached this diagnosis probably more by intuition than by logic. The development of a severe pancreatitis might well constitute adequate grounds upon which the pathologists might justify their requesting an internist to discuss a "surgical case." I cannot exclude some overwhelming infection but am at a loss to more clearly define such a process and therefore will rest my differential discussion with the diagnosis of acute hemorrhagic pancreatitis.

Dr. Smith: Thank you, Dr. Jacobson. Are there any questions or discussion from the audience?

Member of Audience: I would like to suggest the possibility of infarction of the greater omentum which is usually left intact in the operation for benign ulcer.

Member of Audience: Another possibility in a case such as this, with a large penetrating ulcer, is erosion into the common bile duct, leading to an overwhelming ascending cholangitis.

Member of Audience: I find it difficult to believe that this is an acute pancreatitis in view of the leukopenia which is present.

Dr. Jacobson: As far as the leukopenia is concerned, all I can say is that whatever condition this patient has, the leukopenia will probably be difficult to explain. It is not uncommon, however, for many overwhelming inflammatory processes to result in a leukopenia.

Dr. Gleason: We had a lengthy discussion while we were preparing the protocol for this case, as to vhether to carry the history through to the death of he patient, or not. I suppose this may be criticized ut we finally decided to interrupt the history where we id to provoke more discussion.

The operation which was performed was an exploraory laparotomy, done to evaluate some of the possibiliies which Dr. Jacobson has discussed. There were about 00 cc. of blood-tinged fluid in the peritoneal cavity. The liver appeared somewhat darker and softer than sual but did not appear to be infarcted. All of the uture lines were intact and the anastomoses were atent. Exploration revealed only moderate distention f the small intestine, with no mechanical obstruction. There was no evidence of any localized nor generalized eritonitis. The pancreas appeared normal.

The patient remained in approximately the same eneral condition, with persistent vascular collapse, cyanosis, rapid pulse and rapid, shallow respirations. No other unusual signs or symptoms intervened, but the patient expired approximately twenty-four hours after the second operation.

Dr. Smith: Dr. Jacobson, would you care to make any further remarks, in the light of this additional history?

Dr. Jacobson: No thank you. I'll just sit back and listen.

Dr. M. Barron: Well, in order to defend Dr. Jacobson, I would like to ask why the surgeons thought it was necessary to operate. I didn't think it was pancreatitis but I didn't know what in the world it was. But what was the indication for operation?

Dr. E. Flink: I might add a word about that. Nothing that was being done seemed to be doing any good. The internists who were consulted on this case didn't have any good ideas, either. One thought that this was a Gram-negative bacteremia related to the indwelling catheter and one of the purposes of the operation was to do a cystostomy. The bladder was found to be quite normal. The hope was to find something that could be corrected.

Question from Audience: Were blood cultures taken?

Dr. Smith: Several blood cultures were taken and were negative.

Question from Audience: Were stool cultures taken?

Dr. Smith: They were taken but had not been reported on before death.

Autopsy Findings

Dr. Gleason: The heart and lungs were quite normal. The significant pathology was limited to the abdomen. There were 2,500 cc. of clear, straw-colored fluid in the peritoneal cavity. The peritoneal surfaces were smooth and glistening, with no evidence of peritonitis. The small intestine was of a peculiar rusty brown color, darker than normal. All of the operative sites were in good condition. There was only mild submucosal edema and hemorrhage in the inverted duodenal stump. The opened small intestine appeared normal to a point about two feet from the gastric anastomosis. Beyond this point the wall of the intestine was much thinner and softer than normal. The mucosa appeared to be absent and was represented by a practically complete, soft greyish white tubular cast lying free in the lumen of the intestine (Fig. 1). The entire small intestine was also moderately distended by a thin, cloudy, greenish gray liquid. No other abnormalities were found in the remainder of the examination.

Microscopic examination of the involved intestine revealed complete loss of the mucosal layer, leaving the muscularis mucosae practically intact, and there was only a mild subacute inflammatory reaction at the surface and extending a short distance into the submucosa, and a thin layer of inflammatory granulation tissue on the denuded surface.

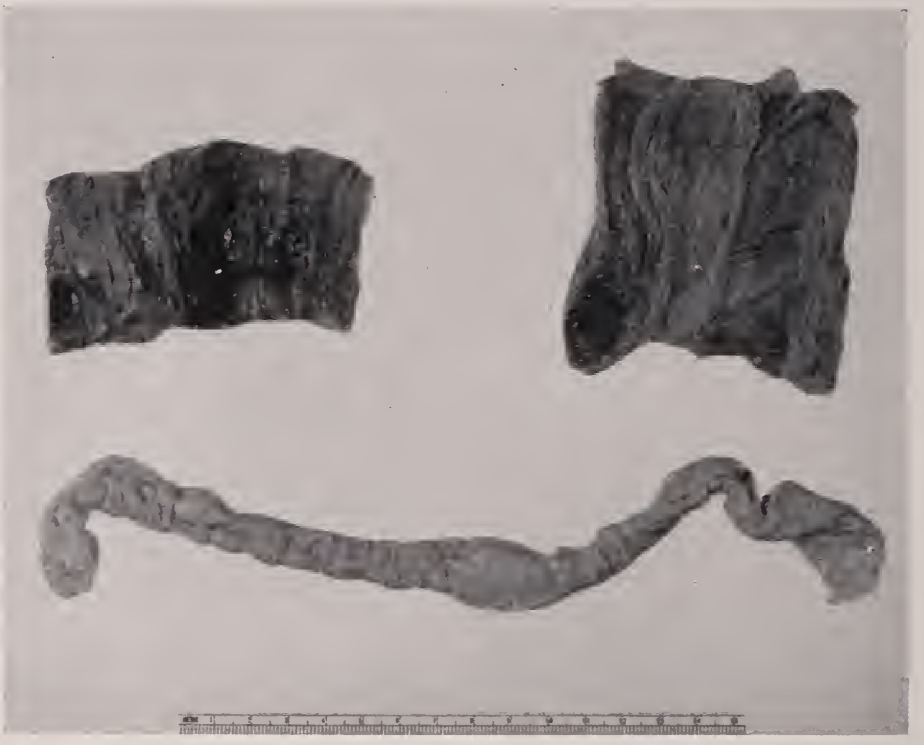


Fig. 1. Two segments of the small intestine, completely denuded of mucosa, and a portion of the soft cast found within the lumen of the small intestine.

Sections of the mucosal cast revealed that it consisted of an amorphous layer of fibrin and necrotic material in which there were embedded many mononuclear and polymorphonuclear leukocytes. During the last day of life rectal swab material had been cultured, at the instigation of Dr. Lyle Hay, who suggested the correct diagnosis. These were streaked on ordinary chocolate agar. As seen in Figure 2, there grew out an almost pure culture of an organism which was found to be a hemolytic staphylococcus aureus, coagulase negative. Only very few colonies of other bacteria were present on the slide. With this information, we went back to our microscopic material, and at only one point, on the inside of the tubular cast, could we find some of the luminal content adherent to the cast. In this there were numerous staphylococcal forms, sometimes in solid masses.

Our final diagnosis in this case is, of course, the syndrome of a staphylococcus enteritis causing a pseudomembranous ulcerative enteritis.

This is a condition which is not new. It was described in the American literature as long ago as 1893, as an occasional complication of gastroenterostomy for peptic ulcers. It is usually manifested clinically by what appears to be an acute peritonitis, with pain and swelling of the abdomen, nausea, vomiting, high fever and very severe shock. The usual case, of course, also presents a severe, watery diarrhea, which, however, may fail to manifest itself before death. It is this enormous loss of fluid and electrolytes into the lumen of the bowel in addition to the toxemia of the bacteria themselves, which causes the profound shock. Good analogies have been drawn between this syndrome and Asiatic cholera, and the same heroic water and electrolyte administration is required in the syndrome under discussion.

The pathogenesis of pseudomembranous ulcerative enteritis was unknown until recent years. Attempts to identify a causative organism were hampered by the use of selective media for the known pathogens, until it was finally appreciated that many of these patients had practically pure cultures of staphylococci in the intestinal content which were repressed by the selective media. The prevailing views now suggest that the staphylococcus comes to predominate in the intestinal flora when the normal conditions are disturbed by several factors, among which may be included intestinal obstruction, abdominal surgical procedures, many chronic disabling illnesses, and very probably the administration of various antibiotics which do not repress the staphylococci, or from the action of which the staphylococci may subsequently "escape."

It should be emphasized that this disease is not analogous to the bacillary dysenteries, in which much of the disability is due to tissue and blood stream invasion and liberation of endotoxins. It is more closely analogous to staphylococcal food poisoning in which preformed staphylococcal exotoxin is ingested in contaminated food and causes a violent gastroenteritis, while the staphylococci themselves do not invade the tissues, and in fact, do not even survive. In the present syndrome, however, the staphylococci are actually living within the lumen of the bowel and produce their potent exotoxins there. The pseudomembranous ulceration of the mucosa is probably produced by the direct action of these toxins and not by the organisms themselves.

I would like to say on behalf of the laboratory that you must be careful how you present this material to your bacteriologist if you suspect this staphylococcal enteritis. Do not ask him to culture for enteric pathogens. The highly selective media inhibit the growth of staphylococci. Do not ask him to "culture for staphylococci." He may use a selective medium for staphylococci. Almost all fecal material contains appreciable numbers of staphylococci. It is essential to establish that the staphylococci are the *predominant* organism. Examination of a direct smear may give strong confirmation of your suspicion if the smear is loaded with staphylococci. The material should be streaked on ordinary blood or chocolate blood agar and examined for the predominant organism.

Sensitivity studies should be carried out promptly. Treatment of the water and electrolyte problem should be instituted immediately, but an antibiotic must be found which will control the staphylococci. In our case, the organism was resistant to all the antibiotics which were being used, but it was sensitive to erythromycin, which incidentally is probably the antibiotic of choice in this community in which staphylococci resistant to other antibiotics are rapidly increasing in numbers.

Finally, it should be noted that some apparently identical cases of this syndrome have failed to yield staphylococci, and other organisms may apparently cause a similar enteritis.

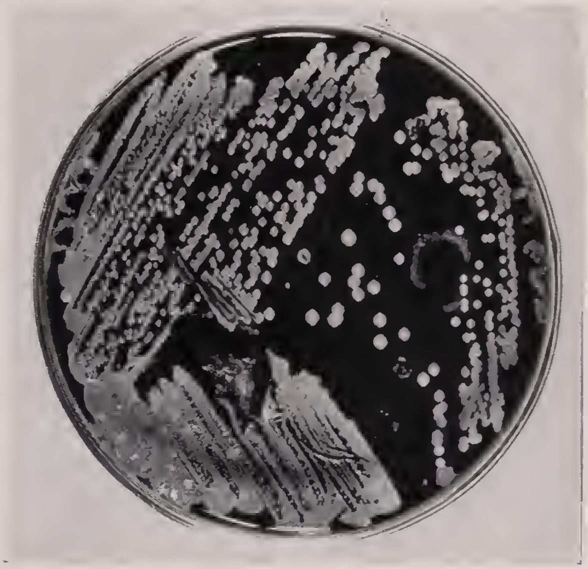


Fig. 2. Photograph of the chocolate agar culture of the rectal swab. Practically pure culture of staphylococci.

References

1. Emerson, C. P., Jr., and Ebert, R. V.: A study of shock in battle casualties. Ann. Surg., 122:745, 1945.
2. Borden, C. V., and Hall, W. H.: Fatal transfusion reactions from massive bacterial contamination of blood. New England J. Med., 245:760, 1951.

THREE PER CENT OF AIRLINE PASSENGERS ARE AMBULATORY PATIENTS

An estimated 3 per cent of all passengers flown by regularly scheduled U. S. airlines pose a unique problem for transportation officials and physicians—unique because they are ambulatory patients who must travel as ordinary passengers.

Maj. Gen. Harry G. Armstrong, U. S. Air Force surgeon in Wiesbaden, Germany, discusses "Air Travel and the Ambulatory Patient" in the current *International Forum,* a supplement to *Therapeutic Notes* published for physicians by Parke, Davis & Company.

"During 1954, it is estimated that approximately 1,000,000 of the 34,500,000 passengers flown by the regularly scheduled airlines of the United States were suffering from some disease or disability," he says.

Gen. Armstrong writes that the figure shows physicians are constantly being asked to advise their patients on the effects of air travel. He adds that "all clinicians should be fully qualified to deal with this subject."

Health laws and transport regulations, flight safety, and the possible effects of aerial environment on the patient, he explains, all are factors which must be considered by both the physician and the airlines.

Because of strict Civil Air Regulations, Gen. Armstrong says, "We can predict fairly accurately the type and degree of deviation from normal to which a patient traveling by air may be subjected."

However, he points out that there are several "deviations" which must be considered in each case.

"The first is air sickness, which is clinically identical with carsickness, trainsickness, and seasickness, and thus, is not peculiar to flying."

Gen. Armstrong says oxygen deficiencies and expansion of body gases also are factors for the patient and his physician to consider. He emphasizes the advising physician must determine whether any of these factors would have a detrimental effect on the primary disease.

However, Gen. Armstrong points out that many physicians have been "unnecessarily restrictive in permitting cardiac and respiratory patients to travel by air."

"Identification of those who should fly is relatively simple, if airline flight procedures are understood. In questionable cases, the medical director of the airline concerned is qualified to provide expert opinion and guidance," he says.

Editorials

JOHN F. BRIGGS, M.D.
ARTHUR H. WELLS, M.D.
HENRY G. MOEHRING, M.D.

LISTENING ABILITY AND SUCCESS

There is a belated but very real awakening in American education today to the fact that effective listening means learning economy, increased industrial efficiency, and better professional relationships. *Belated,* because many years have passed since Dr. Paul Rankin's research in which he reported that about 70 per cent of our waking day is devoted to verbal communication, and that 45 per cent of that verbal communication is devoted to listening. *Very real,* because more and more we are recognizing that reading and listening are our two great and basic media of learning, and that the latter as well as the former must be given direct attention in school.

One evidence of current interest is found in higher education. Seven years ago but one college was teaching listening; today, at least twenty-two of our leading colleges and universities provide this type of instruction. Furthermore, they are conducting, in all, about twice that number of related, graduate-level research projects in an attempt to discover how listening ability can be improved. Such studies should soon decrease the disparity between past research in reading and listening comprehension. Seven years ago more than 3000 studies related to the former had been published; only fourteen related to the latter had appeared.

Two volumes just published by the Curriculum Commission of the National Council of Teachers of English reveal the present concern of persons in elementary and secondary education. Considerable space is devoted to basic listening skills. Dr. Dora V. Smith, chairman, seems to point the direction our schools are most likely to travel when she declares: "It (the Commission) believes that mastery of the skills of reading, writing, speaking and listening is basic to the American way of life and cannot be subordinated to any other aspect of the school program."

Perhaps the most dramatic recognition of the importance of ability to listen has been by management personnel in American industry. A somewhat sudden realization a few years ago that there are clear-cut dollar values in having employes who listen well has resulted in the institution of a number of training programs designed to achieve that end. Among the first firms to take such action have been American Telephone and Telegraph, The Methods Engineering Council, General Motors, The Dow Chemical Company, The Wood Conversion Company, Minnesota Mining and Manufacturing, and many others. The number is steadily increasing. As Frank E. Fischer, Director of the Communications Course of the American Management Association, has put it: "Efficient listening is of such critical importance to industry, that as research and methodology improve I feel that training departments will have to offer courses in this field."

Within a few years, one of the first steps an employer will take when considering a new employe will be that of verifying the latter's listening index. This index will be derived from standard tests of listening comprehension already available and on the market. The next move—an entirely reasonable and desirable one—may well prove to be the use of the listening index as an additional criterion for the screening of candidates for medicine, law, or other types of professional training.

RALPH G. NICHOLS
Professor of Rhetoric
University of Minnesota

STEROIDS AND ARTHRITIS

Hench, Kendall, Slocumb and Polley announced in 1949 the potent effects of ACTH and cortisone on rheumatoid arthritis and related conditions. The vast experience of the past six years with these preparations and subsequently developed derivatives has substantiated and extended the early reports. The steroids are of proved value for systemic use in the treatment of rheumatoid arthritis and arthritis associated with other systemic diseases, such as rheumatic fever, in the treatment of lupus erythematosus and drug sensitivity and occasionally in the symptomatic management of the acute painful shoulder. The steroids are less satisfactory for systemic use in the long-term control of the episodic type of rheumatoid arthritis and palindromic rheumatism because of difficulties in adjusting dosage. These hormones are not of value for systemic use in osteoarthritis and should not be used in specific infectious arthritis.

Much has been published concerning the metabolic changes seen in short-term therapy with the steroid hormones. These metabolic effects develop more quickly with excessive dosages and occur nore readily in women than in men. Postmenopausal women and preadolescent children require a smaller dose than men for therapeutic effect and are especially susceptible to the effects of overdosage. Reversal of these changes is much slower in patients who have taken steroids for more than two months than in those who have taken them for ess time.

A systemic reaction occurs in many patients given these steroids in excessive doses for prolonged periods for control of rheumatoid arthritis. This eaction is characterized by emotional instability, atigability and generalized aching, in addition to one or more of the clinical changes typical of Cushing's syndrome. If such a reaction is not recognized and managed by gradual reduction of dosage in addition to conservative management of he systemic illness, a mesenchymal reaction simulating lupus erythematosus or periarteritis nodosa may develop. Such mesenchymal changes may be mistaken for a flare of the arthritis.

The steroids should be used as an adjunct to he accepted conservative methods of treatment of heumatoid arthritis, namely, rest, physical ther-py and salicylates. Systemic steroid therapy for heumatoid arthritis is usually most effective when he smallest possible daily dose needed to suppress he systemic disease is administered in divided oses of relatively equal portions every 6 to 8 ours. Caution is necessary to insure that the eroids are not used primarily as analgesics to low excessive use of damaged joints. Intra-rticular injections of steroids may be of benefit in dividual selected instances.

The development of analogues of cortisone pro-ucing anti-inflammatory effects with somewhat ss alteration of electrolytes encourages hope for mproved steroid therapy with even more selective fectiveness for certain types of arthritis in the ture.

JOHN G. MAYNE, M.D.

SALESMANSHIP

How many new and valuable ideas, inventions, developments and theories have been lost to the world because of lack of skill in properly presenting their merits, thus defeating their acceptance by others and the world at large?

Whether the nature of our work be an avocation or along professional lines, would it be too broad a statement to say that if our efforts are to be successful resulting in accomplishment, there is a requirement on our part of salesmanship in its true sense?

Should we agree—then "What is salesmanship?" Is it the blatant haranguing of the "barker?" Is it the horse-trading instincts of the "Yankee peddler" — the fast-talking, boisterous-living, flashily dressed "drummer," all of whose characteristics in the minds of many frequently continue to be associated with the term salesman?

It is none of these. Under present-day circumstances, their methods would fail to succeed. Because of modern newspaper circulation, circulation of magazines, trade journals, scientific journals, expansion of education, radio, television and increasing ease of travel, communication has expanded far beyond that of the past. Thus, distribution of ideas, services and goods has developed into a higher science in meeting the requirements of our changing world.

Perhaps it is too general in comprehensive definition to say that salesmanship is the skill by which ideas, services and goods are properly presented to others and the world at large. Perhaps it would be better to say it is the measure of "wit" by which we present our offerings to the world.

Wit is one of the most important tools of selling. It would be worthwhile for everyone to review carefully the definition of "wit" in Webster's Unabridged International Dictionary which employs a full column of fine print for the purpose. It will be noted that "wit" should not be confused with its synonym "humor." Humor commonly implies broader human sympathy but does not imply all of the meaning of "wit," since "wit" is more purely intellectual, embodying humor only when required.

In the objective of gaining the acceptance for our ideas, services or goods offered, we must first have a thorough knowledge and background of our subject. It is then that our skill or wit comes to play so that logically and intelligently we portray and properly present what we desire to offer. Our aim is to influence people to think as we think, to desire as we wish them to desire.

The style of presentation must be altered and suited according to our estimation of the personality or personalities whose attention we wish to obtain. This is necessary, if we are to gain acceptance for our proposal. Thus we must maintain a flexibility in our approach since individual personalities are as different as human nature provides.

For example, a technical man may freely discuss his subject with another technical man in the understandable terms of his profession. Should he similarly discuss the same subject with one who has no technical training, he may sound impressive but would not be understood. To the latter, we must translate our presentation into simple layman language if our point is to be made.

In any walks of life, an expert thoroughly skilled in his subject but who shows intolerance toward any except those whose knowledge is equal to his own will seldom develop many friends. The expert who listens with patient interest to the views of all others before expressing his own ideas makes closer friends, develops their confidence and will have more of his views accepted. It is he to whom most people will wend their way for advice.

Where our objective is to gain an acceptance for what we have to offer, be it ideas, services or goods, we must develop in the mind of the listener the value it has for him and his desire to have it. In so doing, we must with friendly attitude develop a confidence in what we are offering and in ourselves. Thus we must show an honest and sincere interest in our product and an enthusiastic belief in the value we are attempting to share or have accepted by others.

We must show an unselfish and willing interest by backing our offering with our personal service, thus bringing to attention our personal interest to extend the best benefits of our offering. We must honestly give, in order to get.

For centuries the Chinese have gained a reputation for showing great aversion toward change. Is this a characteristic limited alone to the Chinese?

There is evidence of considerable reluctance on the part of all of us to exchange established habits and ideas for new habits and new ideas. Th applies equally to services and developments well as to brands and types of goods.

Whether we are offering ideas or services or hav the avocation of distributing goods, there is requirement for a high type of salesmanship in a of its ramifications. By our skill or wit, we ma properly present the better values, the new cor cepts of that which we offer if their acceptanc is to be obtained.

Regardless of the path of our work or effor our success and accomplishments depend on thi

Joseph C. Duk

ACTIVITIES OF THE MEDICAL TESTIMONY COMMITTEE

The Medical Testimony Committee of th Minnesota State Medical Association, appointed i 1940 by the President and Council of the Association, has a history of marked accomplishment t its credit.

During the fifteen years of its existence, th committee has investigated the expert medica testimony of thirty-three physicians, about whor a complaint *in writing* was submitted to the committee. At each investigation, the committee ha the assistance and opinion of three specialists i the particular field of medicine involved. In si cases, the testimony was found satisfactory, an the physician was not informed about the investigation. In seventeen cases, the testimony wa found somewhat questionable or over-enthusiastic and the physician under investigation was interviewed by a member of the committee. Th committee's decision and the opinion of th specialists were discussed with each physician, an the results in sixteen cases were very satisfactory In the seventeenth case, however, there was n improvement in the physician's expert testimony and with the next complaint his case was referre to the Minnesota State Board of Medical Examiners for disciplinary action, as were nin others, in which the testimony was of a very seriou nature. In one case, the report was sent direc to the Judge of the Supreme Court who ha requested the examination. This testimony wa very questionable.

During the early years, several requests for investigation were received from physicians. Durin the past five years, only one request has bee submitted by a physician. All others have com from members of the Bar Association. In order to avoid any embarrassment, *no one except the chairman* of the committee has any knowledge of the source of a request for an investigation. Assuredly, the committee does not have a pleasant job, but a serious and uncomfortable duty. In order that the committee may function properly, it is of the utmost importance that the members be kept informed about any questionable expert medical testimony. Only by that means can the committee keep expert medical testimony on a high level in the courts of the state.

The work of this committee has received recognition throughout the United States from other State Medical Societies, as well as from legal societies, law schools, and other organizations. In a recent book on "Legal Medicine," an entire chapter is devoted to the activities of our Minnesota Medical Testimony Committee.

E. M. Hammes, M.D.
Chairman, Medical Testimony Committee

BLUE CROSS AND "TAKE-HOME DRUGS"

Under the Blue Cross contract, the patient pays or "take home drugs."

In the Schedule of Benefits in the Blue Cross contract, Benefit 11 specifies:

> "Drugs, biologicals and solutions used in the hospital and listed in the latest edition of the United States Pharmacopoeia, The National Formulary or New and Non-Official Remedies, except blood and blood plasma."

The phrase "used in the hospital" contained in his benefit means just what it says. To be overed by Blue Cross, drugs must be used in the ospital; drugs taken home or used outside the ospital are also outside the scope of Blue Cross overage.

However, recent audits of hospital records have nown some misunderstanding as to who is respon-ble for payment for "take home drugs." In ertain instances, "take home drugs" had been ncluded in the Blue Cross billing, and Blue Cross ad covered allowances on these cases. To rectify me such situations, it has been necessary for lue Cross to recover substantial sums from the ospitals involved as reimbursement for these ake home drugs" that had been included on the lue Cross bill and that were not covered by the lue Cross contract.

To prevent hardship on the hospital, it is most important that great care be exercised in designating and segregating "take home drugs" from drugs used by the patient in the hospital. If a misunderstanding occurs and Blue Cross is charged for "take home drugs," the hospital is placed in an embarrassing and in a costly position at some future date when such a misunderstanding is discovered, and it is necessary for the hospital to reimburse Blue Cross for the "take home drugs" for which Blue Cross has been billed and has paid. In this situation, the hospital is faced either with the alternative of going back to the patient to collect for these "take home drugs," thus running the risk of poor public relations, or of bearing the expense of such "take home drugs" itself.

Blue Cross is co-operating with the Minnesota Blue Cross hospitals in providing the hospitals with stamps indicating "take home drugs" that the hospitals can use on their records. If care is used is designating and segregating "take home drugs," no "take home drug" problem will arise for either the hospitals or Blue Cross.

Albert A. O'Leary
Director of Hospital Relations,
Minnesota Blue Cross

WHO WILL BECOME AN ALCOHOLIC?

There are warning signs for the potential alcoholic person which appear during and after drinking. A person disposed to alcoholism drinks consciously and purposely for the effects of alcohol on his feelings and attitudes. These feelings may be vague and hard to define, such as a dim awareness of being ill at ease.

On the surface he appears to be well adjusted, but it is a borderline adjustment. He may eventually lose complete control over the time and amount he drinks. He is filled with remorse about what he did yesterday, and he is worried sick about what tomorrow will bring.

Sometimes a person may drink to escape worries or troubles. At a party, he may sneak a a few "quick ones" to steady his nerves. He may have a fixed time for drinking and feel uncomfortable if he misses it. He may find himself thinking more of the drinking than the sociability which goes with it. He may start to lie about his drinking. He may have long periods of sleepless-

---

This is the second in a series of four editorials on the subject of alcoholism.

ness. He may become unjustifiably suspicious or jealous. He may slip himself a drink in the morning. He may start to "get tight" oftener. Then, eventually, he may go on a spree after which, ashamed, he resolves not to drink again. Sooner or later, though, his "nerves" get the better of him, and he takes another drink. This starts another spree. *He may "pull a blank" or "black out."* He may have vague, nameless, constant fears. *These are the storm warnings.*

Paul S. Rahneff
Citizens Commission on Alcoholism, Inc.

DOCTORS—NOT TIME—SHOULD MAKE THE DIAGNOSIS OF CANCER

We have an instinctive belief that many physicians will not receive with enthusiasm the 1956 campaign slogan of the American Cancer Society which emphasizes periodic medical checkups and is designed to increase the number of examinations of presumably "well" people.

There can be no direct criticism of the American Cancer Society for favoring periodic examinations of apparently well people. Its position is strongly arched and buttressed by the overwhelming support of the clear-thinking leaders of the medical profession, the force of public opinion, and sound statistical arguments.

Medical objections to the program will be expressed by negativism and arguments which circumvent the facts, and will come from physicians who have not adjusted their practices to include a place for the patient who wants a periodic checkup.

It is understandable that physicians are not generally enthusiastic about periodic examinations of apparently well people. Frankly, we have been thoroughly bored by a deluge of routine examinations: army, insurance, industrial and "what-have-you." We accept, in principle, the value of such examinations but we tend to consider them as necessary evils which mar the pleasures to be derived from practicing a profession. Our enthusiasm is kindled chiefly by the challenge of such matters as a difficult diagnostic problem, or the cure of a seriously ill patient by the skillful use of our knowledge and skills.

While meeting the challenge of skillful diagnosis and therapy, perhaps too many of us are overlooking an equally challenging field of medicine. Up until now, we have been content to settle for a diagnosis of symptomatic cancer, after the differential exclusion of other diseases which cancer so slyly mimics. Actually, though, *time* has made the diagnosis for us: the patient with a symptomatic cancer has had the disease for as long as several months to several years before we see the obvious! The real challenge of the future is the skillful diagnosis of the asymptomatic cancer in the "well" person.

We suggest that a thing seriously pursued affords true enjoyment. That portion of a busy medical practice which is devoted to the searching examination of an apparently well patient who wants to know "Do I have cancer?" is truly enjoyable if seriously pursued.

The dividends are many and rewarding: the gratitude of a patient who can get a satisfactory answer to a vexing question from his personal physician—a patient who will come back again; the frequent detection of latent disease unrelated to cancer, and, though the yield is small, an occasional diagnosis of curable cancer before *time* has made it obvious. Doctors—not *time*—should diagnose cancer.

David P. Anderson, M.D.
Chairman, Cancer Committee, MSMA

RADIATION PROTECTION FOR THE TECHNICIAN IN TRAINING

Emphasis, at the present time, on radiation protection of the entire population seems to make necessary re-evaluation of procedures which in the past were considered acceptable. The concept of tolerance dose of radiation is now redefined (National Bureau of Standards Handbook 59) as a "tolerable" dose. This is intended to convey the concept that all radiation is damaging and that there is no such thing as a dose which will produce no damage. The "tolerable" dose is that which can be accepted without any *detectable* damage within the life span of the individual.

On the basis of this concept, it is the responsibility of all individuals, schools, and hospitals who utilize and teach x-ray procedures to eliminate, wherever possible, unnecessary exposure to x-radiation. No longer can one justify utilizing students as "patients" in teaching x-ray technique. No radiographic procedure using a student as patient can be considered acceptable unless the end results of the procedure are medically useful for the individual patient (as, for example, the routine chest film required on admission to the school).

On the basis that the school can no longer justify what might rightly be termed "spending part of the tolerable lifetime radiation dose" for the student, how can a school not connected directly with a hospital or supply of patients teach x-ray technique properly without using students as patients?

There are readily available substitute materials which can be used to teach x-ray physics, radiographic exposure techniques, etc. Untempered masonite suitably replaces water equivalent tissue (as the abdomen). Plywood has a density equivalent to the thorax. Use of these materials will reduce considerably the necessity for using patients during the early part of the technician's training. Anatomy, radiographic anatomy and positioning for radiography can be taught without energizing the x-ray machine. The final stage of training, in which the procedure on the patient is necessary, will then not be possible in the school, unless arrangements can be made with a clinic or a hospital.

On the basis of recent interpretations of tolerance dose of radiation, it is the opinion of he writer that the time has come to consider nnecessary exposure to the technician in training s a removable hazard and to move to condemn uch practices *in toto*.

James F. Marvin, Ph.D.
Radiological Physicist

VHAT CONSTITUTES THE PRACTICE)F MEDICINE?

An official answer to a problem harassing both hysicians and hospital Boards of Directors over he country was sounded for the third time in nore than a decade before the House of Deleates of the American Medical Association at the oston Clinical meeting last November. The eport of the committee on Medical Education and Hospitals which was approved by the delegates follows:

> Whereas, The American system of private practice of medicine has given us the highest health and medical standards in the world; and
>
> Whereas, The American Medical Association has publicly declared its stand in favor of this system of private practice; and
>
> Whereas, The practice of pathology, including both clinical and anatomic pathology, is the practice of medicine; and
>
> Whereas, In many states the attorneys general have written opinions stating that the operation of laboratories and departments of radiology and anesthesia by corporations, including hospitals, is illegal, and that the acceptance of employment from such corporations by a licensed practitioner of medicine under terms permitting the corporation to charge a fee for his services is unethical fee splitting and illegal; and
>
> Whereas, As a result of such interpretations attempts are being made by certain lay groups to amend the laws, or their interpretations, to permit the division of pathology into professional and technical services, the latter to be the work of the pathologist's technical assistants who perform under his direction and supervision and not to be considered the practice of medicine and, therefore, services which may be legally performed by a hospital; and,
>
> Whereas, If this position should be sustained, fragmentation of the practice of pathology would be accomplished and thus all medicine would be in danger of being so divided to the detriment of the patient; and
>
> Whereas, As early as 1943 the American Medical Association studied this problem and stated that the "House of Delegates of the American Medical Association is opposed to the division of any branch of medical practice into so-called technical and professional factions," and later, in 1951, that "the practice of anesthesiology, pathology, physical medicine, and radiology are an integral part of the practice of medicine in the same category as the practice of surgery, internal medicine, or any other designated field of medicine"; therefore be it
>
> Resolved, That the House of Delegates of the American Medical Association is opposed to the division of any branch of medical practice into so-called technical and professional services; and be it further
>
> Resolved, That because of the confusion existing in some states in regard to this question this House of Delegates reaffirm the position taken in 1943 and 1951.

President's Letter

MINNESOTA AND THE AMERICAN MEDICAL EDUCATION FOUNDATION

The National Fund for Medical Education was founded in 1951 for the purpose of securing voluntary contributions from industry, medical associations and individual physicians to help meet the rising cost of medical education. It was estimated that $10.000,000 annually in additional funds were needed by our eighty-one medical schools, if they were to maintain their high standards of teaching and research. The American Medical Association undertook to raise $2,000,000 of this amount annually from the physicians of the nation, on a voluntary contribution basis. The AMA generously contributed $500,000 annually for the years 1951-54, inclusive, then in 1955, reduced their contribution to $100,000, believing, that as the individual physicians became aware of the need, they would make up the difference. The AMA, in 1951, set up the American Medical Education Foundation as an agency to solicit and collect the physician's share of the voluntary contributions, and agreed to pay all operational costs of the agency so that every dollar contributed would be turned over to the National Education Fund to be distributed to the Medical Schools.

Minnesota, as did most of the other states, got off to a slow start. From 1952 to May, 1955, Minnesota doctors had contributed only $27,000. Minnesota's share of the needed $2,000,000 would be about $40,000 annually.

In 1954, 138 Minnesota doctors contributed $5,890.38. In 1955, 588 doctors contributed $17,147. In May, 1955, our House of Delegates voted to support the plan of Dr. H. E. Drill, State Chairman, to solicit on the County Society level with a chairman in each county society and a councilor district chairman to co-ordinate their activities. In September, 1955, Dr. Drill called a meeting of all the county chairmen and councilor chairmen at St. Paul for purposes of information and organization of a definite campaign period.

I am glad to report to you that as a result of this effort, Minnesota doctors are doing much better. In January, 1956, 248 contributors gave $7,590 and 142 contributors gave $2,996.75 in February, 1956, or a total of $10,733.75 in two months. But that accounts for only 390 contributors out of our membership of approximately 3,000, roughly 12 per cent. What has our Medical School received in return from the National Fund? In 1954, the University of Minnesota Medical School received $35,762.75, and total grants to January 1, 1955, have been $102,718.75. The 1955 figures are not yet available.

The week of April 23-29, 1956, has been designated as National Medical Education week, of which you will hear much more in the immediate future. I trust you will all participate in the week's activities in your respective communities and will become inspired to join the increasing numbers contributing to the American Medical Education Foundation in our state.

R. H. Wilson

President, Minnesota State Medical Association

Medical Economics

Edited by the
Committee on Medical Economics,
Minnesota State Medical Association
George Earl, M.D., Chairman

COUNTY SOCIETY OFFICERS MEETING

The County Society Officers meeting in Saint Paul on February 25 dealt with three aspects of the current medical scene of interest to Minnesota doctors. They were "Medical Care for the Indigent," "Insurance Plans for Members" and "National Legislation and the Medical Viewpoint."

Medical Care for the Indigent

Dr. C. L. Oppegaard, chairman of the Council, described the history and development of medical care for welfare patients in this state. He spoke of the improvement of medical care from the old county physician days to the present day program where all relief clients have the free choice of doctor; it is this approach for which the state association has fought, though it was not adopted until the special session of 1937.

Those people who are receiving aid today are getting excellent care and all concerned can take justifiable pride in solid progress. However, it is difficult to keep rising costs under control while carrying on a program of good medical service. Dr. Oppegaard said:

> "Remember, the alternative to willing and zealous co-operation on the part of the doctors of the state may well be new bills to cut costs; bills that will not only cut costs, but cut medical service to the point where the good work of years will be undone. So costs *must* be cut. At the same time standards of service *must* be maintained. Those are the two horns of our dilemma. We must ride them both, if we are not to sacrifice the progress achieved over many years in our system of medical care for the needy sick."

Mr. Morris Hursh, Director, Department of Public Welfare, praised the close and pleasant contact his office has had with medical groups in Minnesota: the Council and members of the Minnesota State Medical Association; Dr. R. H. Wilson and the members of the State-Wide Medical Advisory Committee.

The rising cost of medical care to welfare patients has been of great concern to the Department of Public Welfare and the Legislature. In 1955 the Legislature decided that (1) no type of medical care should be paid for by the county unless it had been authorized by the County Welfare Board and (2) maximum fees should be established for every kind of care, including drugs as well as medical procedures.

Mr. Hursh felt that prior authorization was sound business practice, but that the setting of fees was already being done by the State-Wide Advisory Board. However, on April 1 the new maximum fee schedule, the same schedule used by Blue Shield Plan A for medical and surgical care, and by Blue Cross for hospital charges, will go into effect.

Though doctors' fees account for only 12 per cent of the total welfare bill, doctors hold the key to the success of the program, because it is their responsibility to authorize hospital and nursing home care. Fee schedules for individual counties will be worked out separately and it is important to remember that the schedule is a maximum.

Prior authorization is sometimes difficult to handle, especially when it is necessary for a patient to remain in the hospital for thirty days or longer. One benefit that results from this requirement, however, is that hospital stays are being shortened, which might be a big factor in bringing down welfare costs.

Regarding the general principle of welfare care, Mr. Hursh emphasized that no one wants to give less adequate care to welfare patients. Also, that rising costs should not be a surprise: as the lengthened life span increases the proportion and numbers of elderly persons, the situation will get worse, and cutting welfare services is not realistic.

President R. H. Wilson, until recently chairman of the State-Wide Advisory Committee of the Division of Public Welfare, said that inflation and the growing geriatric problem accounted largely for the rising costs of medical care to the state. The mean age of recipients is seventy-seven years in Minnesota.

According to Dr. Wilson, prior authorization for medical care creates a problem of much additional time and labor on paper work. And, not being doctors, county boards cannot conscientiously refuse medical care that a physician has requested.

The decision reverts to the medical advisory committee, whose members judge the necessity for the care and eliminate unnecessary care.

Prior authorization for hospitalization is a different matter. It works well in limiting the length of time patients stay in the hospital and reduces hospitalization costs. A further reduction will show up when nursing home care has been limited.

Dr. Wilson commended the co-operation of the Department of Public Welfare and said that though a state-wide uniform fee schedule was considered more desirable, most doctors are not dissatisfied with the new maximum schedules where each county welfare board and county medical advisory committee negotiates individual county rates. The State-Wide Medical Advisory Committee approves county schedules, but does not enter into the negotiations, he emphasized.

GROUP LIFE INSURANCE

Mr. A. R. Hustad, Northwestern National Life Insurance Company, explained the program available to Active and Resident members. Members who are sixty-five or younger are eligible for $5,000 insurance and members who are sixty-six to seventy-five are eligible for $2,500 insurance under certain conditions. Premium rates are very low; for example, the annual premium for $5,000 insurance for a man of thirty-five is $34.50.

Members of component societies where the plan has been accepted can take out the insurance at any time, if they are insurable. Also, any member of one of these societies can take out insurance until May 1 without a physical examination, provided a total of 100 members from qualified societies enroll.

New societies can participate in the plan this year without a physical examination being required of applicants, provided seventy-five per cent of the active members enroll.

A complete discussion of malpractice insurance will appear soon in Minnesota Medicine.

NATIONAL LEGISLATION

Mr. C. Joseph Stetler, Director, Law Department, AMA, described AMA activities with regard to national legislation. Of the 12,000 bills introduced at the first session of the 84th Congress, 400 of them had some connection with medicine.

Seventeen people employed in the Washington office of the AMA spend most of their time answering inquiries from Senators and Representatives. Other duties include arranging for medical witnesses on proposed legislation, preparing testimony, and studying bills.

The cornerstone of the health proposals of the Administration is a program for medical research and one-time grants to medical institutions. Since opposition had been to maintenance support that would eventually give the government a voice in management and policies, this program is not considered objectionable.

Discussion of shortages in the medical field is no longer concentrated on doctors: nurses and certain specialties are listed as being short of qualified personnel.

Greater emphasis has been placed on removing the obstacles in the way of private companies handling poor health insurance risks. Reinsurance as a government issue seems to be dead.

It has been proposed that the Hill-Burton Act be extended for two years after 1957 when it was to expire. The AMA feels that the time has come for an appraisal of what has been accomplished with this act; to see if it has fulfilled its purpose and to judge whether it is the best answer to the problems in the field of hospital construction aid.

The Defense Department has a bill that would offer greater incentives to induce more doctors to make a career of the service. This is being supported, though it does not go far enough to be fully effective. Some bill dealing with doctors in service will be passed and it is to be hoped that it will be more effective than the present one.

Congress is now considering a bill that would authorize commissions for osteopaths in the armed forces. If this bill should become law, it would mean that osteopaths would share the same responsibilities that M.D.'s have as medical officers; servicemen would not know what training the doctor treating him had received. This, of course, would wreck any plan for an incentive program for M.D.'s.

Several approaches to the question of medical care for military dependents have been suggested. The AMA takes the position that care for military dependents at military facilities and by military personnel should be restricted to overseas establishments.

Mr. Stetler underlined the fact that though the AMA can evaluate legislation and alert the profession to bills inimical to the welfare of medicine and the country as a whole, their main function is to provide information for Congress and other departments of the government.

SEARS FOUNDATION CONTINUES PRACTICE GRANTS

The Sears-Roebuck Foundation has announced that it has allotted $125,000 to continue its program of long-term, unsecured loans to physicians to help them set up practice units. Greater emphasis will be placed on locating doctors in communities without medical care.

Last year the Foundation assisted in establishing ten units, some to retain existing facilities in areas about to lose them. Loans range from $3,000 to $25,000 to applicants screened and selected by a seventeen-man advisory board of physicians named by the trustees of the AMA. Dr. J. A. Bargen, Mayo Clinic, is the member from this region. This year a minimum of $149,000 will be available for the program.

Mr. Theodore V. Houser, president of the Foundation, has said:

> "Some of the criteria for evaluating requests for assistance will be the professional qualifications of the applicant, the availability of medical service in the community, the extent of community participation in establishing the proposed unit, and the soundness of the plans proposed for providing medical care."

He emphasized that loans will not be made for the purpose of refinancing current obligations.

Grants are repayable any time within ten years, with payments being made in equal monthly installments starting not later than the beginning of the fourth year. Until repayment is begun, interest is charged at the rate of 6 per cent per year, payable monthly. No interest is charged after repayment begins. After the fifth year when interest payments have ceased, recipients make monthly contributions to a revolving fund. This is in recognition of the aid they have received and to assist other physicians.

All interest money and pledge money, along with all repaid loans, is used for the purpose of establishing additional medical practice units. The addition of these funds to the basic amounts provided by the Foundation will enable the plan to grow, Mr. Houser said.

THE MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

230 Lowry Medical Arts Building
Saint Paul 2, Minnesota

F. H. Magney, M.D., Secretary

MINNEAPOLIS MAN SENTENCED FOR VIOLATION OF BASIC SCIENCE LAW

Re: State of Minnesota vs. Lafayette M. Gray

On February 18, 1956, Lafayette M. Gray, eighty-one, 5025 Queen Avenue South, Minneapolis, was sentenced by the Hon. John A. Weeks, Judge of District Court of Hennepin County, to a term of 30 days in the Minneapolis Workhouse following Gray's plea of guilty to practicing healing without having a basic science certificate. However, Judge Weeks suspended the sentence on condition that the defendant refrains in the future from selling Powdr-X and that he surrenders his supply of Powdr-X to the authorities.

A complaint had been issued on February 9, 1956, charging Gray with the above offense after he had examined a Minneapolis woman and recommended his product Powdr-X for her condition, making a charge of $3.00 for a can of the powder. Gray told the woman that Powdr-X would "pep up her appetite" if taken internally, and for her eye condition he recommended that she put a teaspoonful of it into a glass of warm water and after letting it settle, use the liquid in an eyecup three or four times per day.

The defendant has a previous conviction in United States District Court in Minneapolis on March 22, 1950, when he was sentenced by Judge Gunnar H. Nordbye to pay a fine of $1,000.00 following Gray's entering a plea of "nolo contendere" to two counts in an information charging him with violating the Federal Food, Drug and Cosmetic Act. Gray had been convicted by a jury in the same Court on March 27, 1948, of introducing in interstate commerce at Minneapolis, a number of packages containing a drug called Powdr-X, and it was charged that a letter accompanying the shipment contained the following statement: "In fact it is an ointment that is splendid for almost any infection, abrasions, or ulcers." It was further alleged that the drug was misbranded in that the above statement was false and misleading because the drug is not efficacious in the cure, mitigation and treatment of infections, abrasions or ulcers. Following his conviction by the jury, Gray appealed to the United States Circuit Court of Appeals, which Court reversed the conviction because of errors in the form of verdict used and remanded the case for a new trial.

MAN IMPERSONATING PHYSICIAN SENTENCED TO FIFTEEN-YEAR PRISON TERM FOR GRAND LARCENY

Re: State of Minnesota vs. Raymond Thayer Lawton

On February 8, 1956, Raymond Thayer Lawton, forty-six, formerly of White Bear Lake, Minnesota, was sentenced to a term of fifteen years in the State Prison at Stillwater, Minnesota, by the Hon. Axel B. Anderson, Judge of the District Court, at Faribault, Minnesota. Lawton had been tried and found guilty by a Rice County jury on January 25, 1955, of grand larceny in the second degree. However, the defendant was not sentenced at that time because he entered a plea of not guilty when arraigned on an information charging him with four prior convictions for felonies. While Lawton was awaiting trial on this charge, he escaped from the

(Continued on Page 262)

The Dean's Page

LABORATORY MEDICINE

The day seems to be passing in which the physician performs much of his own laboratory work. Important as it may be to the diagnosis and management of disease, he will expect others to perform this role. He will come to rely increasingly on the skill of these other hands. This becomes clear when one considers the large contributions that chemistry, bacteriology, hematology, and other laboratory sciences are making to the advance of American medicine in this century.

A physician is by nature a skeptical person. A report from the laboratory may be to him just a slip of paper of questionable value. Still he must come to trust the skills of laboratory workers in order that these skills may help him make the decisions he must make. For this reason, if for no other, each physician and all physicians must be vitally concerned with the establishment of high standards of laboratory training and practice.

There are now many workers poorly trained; there are many schools that exploit heartlessly the needs for workers in this field. Glowing advertisements promise a short pleasure course, immediate vocational success. At the same time, approved schools of medical technology suffer progressive decrements in enrollment. Perhaps this field needs a sober study such as the one which culminated in the Flexner report on medical education in the early part of this century. After that report, organized medicine developed and enforced high standards of medical education, closing the "diploma mills." Today, medical technology, an emerging profession under the aegis of organized medicine, needs its strenuous support and encouragement. Under the best of circumstances, it will gradually fill the need for professional clinical laboratory workers.

In a further attempt to alleviate the shortage of adequately trained personnel, a course for laboratory workers at a sub-professional level was established at the University of Minnesota two years ago. This was established and developed with the cooperation and aid of the Minnesota State Medical Association, the Minnesota Hospital Association, the Minnesota Societies of Clinical Pathology and Medical Technology, and the Minnesota Department of Health. It is a one-year course with six months of formal training at the University and six months of internship in an approved hospital laboratory. The graduates of this course, called Laboratory Aides, will help to provide the need for workers especially in hospitals in smaller communities and in doctors' offices.

Modern medicine requires a larger laboratory participation in patient management than ever before. The physician is not physically able to perform all these laboratory functions himself. To meet this challenge, medical technology arose as an ancillary profession and with the support of organized medicine and of each individual physician will continue to play a steadily more effective role. There are needs for well-trained workers at a lower level such as laboratory aides. Finally, physicians themselves specializing in this field of endeavor will give it new orientation, force, and effectiveness.

—Harold S. Diehl, *Dean*
University of Minnesota Medical School

Minnesota State Medical Association

103rd Annual Meeting

Rochester, Minnesota—May 21-23, 1956

Preliminary Program

BUSINESS SESSIONS

Kahler Hotel

SATURDAY, MAY 19

2:00 P.M.—Council............University Club, East Room
6:00 P.M.—Council............University Club, East Room

SUNDAY, MAY 20

8:30 A.M.—Council............University Club, East Room
10:00 A.M.—Reference Committees....Mezzanine Floor
2:00 P.M.—House of Delegates....Royal Coach Room
6:00 P.M.—Council............University Club, East Room
8:00 P.M.—House of Delegates....Royal Coach Room

MONDAY, MAY 21

8:30 A.M.—Council............University Club, East Room
12:15 P.M.—House of Delegates......Royal Coach Room
12:15 P.M.—Committee on Medical Testimony Room to be assigned

TUESDAY, MAY 22

8:30 A.M.—Council............University Club, East Room
8:30 A.M.—Committee Breakfasts Rooms to be assigned

WEDNESDAY, MAY 23

8:30 A.M.—Council............University Club, East Room
8:30 A.M.—Committee Breakfasts Rooms to be assigned

SOCIAL EVENTS

SUNDAY, MAY 20

5:30 P.M.—Fellowship Hour for Officers, Councilors, Delegates—Mezzanine Floor, Kahler Hotel.
6:00 P.M.—Smorgasbord, open to all. Rochester Country Club.

MONDAY, MAY 21

Luncheons

12:00 noon—American Medical Women's Association, Minnesota Branch. Town House.
12:15 P.M.—Minnesota Society of Clinical Pathologists. Town House.
5:00 P.M.—Fellowship Hour. Cloud Room. Kahler Hotel.

Dinners

6:15 P.M.—Minnesota Academy of General Practice. Elizabethan Room, Kahler Hotel.
6:30 P.M.—Minnesota Society of Clinical Pathologists. Annual dinner and business meeting. Regency Room, Kahler Hotel.
7:00 P.M.—Minnesota Radiological Society. Centennial Room, Kahler Hotel.

Open House

9:00 P.M.—Minnesota State Medical Association. Mayo Civic Auditorium.

TUESDAY, MAY 22

5:45 P.M.—President's Reception. Cloud Room, Kahler Hotel.

Dinner

7:00 P.M.—Minnesota State Medical Association, Annual Banquet, Elizabethan Room, Kahler Hotel.

ROUND TABLES

Kahler Hotel—12:15 P.M.

MONDAY, MAY 21

Disturbed Clotting Mechanism in Obstetrics
John A. Haugen, Minneapolis
Charles A. Owen, Rochester
Office Gynecology ....M. B. Sinykin, Minneapolis
Management of Head Injuries
Winchell McK. Craig, Rochester
Palliative Treatment for Metatastic Carcinoma of the Breast ....William M. McConahey, Rochester
David G. Decker, Rochester
Fluid and Electrolyte Balance
Edmund B. Flink, Minneapolis
Management of Hypertension ....James J. Coll, Duluth

TUESDAY, MAY 22

Recent Trends in Antibiotic Therapy
Donald R. Nichols, Rochester
Diagnosis and Management of Rheumatic Fever
Paul F. Dwan, Minneapolis
Diarrheas in Infants and Children
Charles W. Rogers, Winona
Treatment of Overweight ....William B. Martin, Duluth
Controversial Issues in Myocardial Infarction and Cardiac Emergencies ....H. B. Burchell, Rochester
Diabetes ....Moses Barron, Minneapolis
Alterations in the Blood Levels During Gestation
W. J. McGanity, Assistant Professor of Obstetrics and Gynecology, Vanderbilt University School of Medicine, Nashville, Tennessee

WEDNESDAY, MAY 23

Peripheral Vascular Diseases (Excluding Hypertension) ....David M. Craig, St. Paul
Convulsive Disorders in Children
V. R. Zarling, Minneapolis

Treatment of Urinary Infections....E. N. Cook, Rochester

Allergic Reactions to Drugs
Louis E. Prickman, Rochester

Management of Asthma With and Without the Steroids ....Albert V. Stoesser, Minneapolis

Management of the Acutely Agitated Patient
Gordon R. Kamman, St. Paul

Present Status of Rh Sensitization
Emil G. Holmstrom, Professor and Head, Department of Obstetrics and Gynecology, University of Utah, Salt Lake City, Utah

GENERAL SESSION

Mayo Civic Auditorium

MONDAY, MAY 21

A.M. *Morning Session*

8:30 Visit Scientific and Technical Exhibits Auditorium

9:00 Closed Circuit Color Television.........Auditorium
Surgery of Biliary Tract Disease

Intermission

10:15 Visit Scientific and Technical Exhibits Auditorium

11:00 RUSSELL D. CARMAN MEMORIAL LECTURE
"New Techniques in Cholecystography"
L. Henry Garland, Clinical Professor of Radiology, Stanford University Medical School, San Francisco, California

11:30 ARTHUR H. SANFORD MEMORIAL LECTURE
"Metabolic Relationship of Potassium, Nitrogen and Sodium"
Paul R. Cannon, Professor of Pathology and Chairman, Department of Pathology, University of Chicago, Chicago, Illinois

P.M.

12:15 Miscellaneous Luncheons
Round Table Luncheons

Afternoon Session

1:30 Visit Scientific and Technical Exhibits Auditorium

2:00 Closed Circuit Color Television.........Auditorium
The Technique of Proctoscopy and Office Procedures

Intermission

3:15 Visit Scientific and Technical Exhibits Auditorium

4:00 "Neoplasms of the Terminal Portion of the Colon"
John R. Hill, Rochester

4:30 MINNESOTA DIVISION, AMERICAN CANCER SOCIETY LECTURE
"Endocrine Influences in the Treatment of Cancer"
Charles Huggins, Professor of Surgery and Director of the Ben May Laboratory for Cancer Research, University of Chicago, Chicago, Illinois

5:15 Obstetric Manikin Demonstration ....Stage
W. J. McGanity, Vanderbilt University

5:15 Visit Scientific and Technical Exhibits Auditorium

6:00 Special Dinners

9:00 Open House....................Mayo Civic Auditorium

GENERAL SESSION

Mayo Civic Auditorium

TUESDAY, MAY 22

Morning Session

A.M.

8:30 Visit Scientific and Technical Exhibits Auditorium

9:00 Closed Circuit Color Television..........Auditorium
The Clinical Use of Cortisone and Related Hormones

Intermission

10:15 Visit Scientific and Technical Exhibits Auditorium

11:00 MINNESOTA HEART ASSOCIATION LECTURE
"Diagnosis and Treatment of Subacute Bacterial Endocarditis"
J. Scott Butterworth, Associate Professor of Medicine, New York University Post-Graduate Medical School, New York

11:30 NORTHWESTERN PEDIATRIC SOCIETY LECTURE
"The Changing Character of Infections as the Result of the Era of Chemotherapy"
Franklin H. Top, Professor and Head, Department of Hygiene and Preventive Medicine, State University of Iowa, Iowa City, Iowa

P.M.

12:15 Round Table Luncheons

Afternoon Session

1:30 Visit Scientific and Technical Exhibits Auditorium

2:00 Closed Circuit Color Television..........Auditorium
Orthopedic Surgery—The Painful Shoulder

Intermission

3:15 Visit Scientific and Technical Exhibits Auditorium

4:00 "Physical Medicine"
Miland E. Knapp, Minneapolis

4:30 MINNESOTA MEDICAL FOUNDATION LECTURE
"The Patient Who *Won't* Get Well"
Donald W. Hastings, Professor and Head, Department of Psychiatry and Neurology, University of Minnesota, Minneapolis

5:15 Obstetric Manikin Demonstration ....Stage
Emil G. Holmstrom, University of Utah

5:15 Visit Scientific and Technical Exhibits Auditorium

Evening Entertainment

7:00 ANNUAL BANQUET
Elizabethan Room, Kahler Hotel

GENERAL SESSION

Mayo Civic Auditorium

WEDNESDAY, MAY 23

Morning Session

A.M.
8:30 Visit Scientific and Technical Exhibits
Auditorium
9:00 Closed Circuit Color Television........Auditorium
Abnormal Uterine Bleeding

Intermission

10:15 Visit Scientific and Technical Exhibits
Auditorium
11:00 "The Importance of the Diagnosis of Glaucoma"
P. J. Leinfelder, Professor of Ophthalmology, College of Medicine, State University of Iowa, Iowa City, Iowa
11:30 "Industrial Noise, Every Physician's Problem"
K. M. Simonton, Rochester
P.M.
12:15 Round Table Luncheons

Afternoon Session

1:30 Visit Scientific and Technical Exhibits
Auditorium
2:00 Closed Circuit Color Television........Auditorium
Management of Common Skin Diseases
3:15 Medical Quiz
Frank Krusen, Rochester, Moderator

SPECIAL SESSIONS

MONDAY, MAY 21

Morning Session

A.M.
9:00 Minnesota Society of Clinical Pathologists—Annual Tumor Clinic
Judd Hall, Mayo Clinic, New Building
Moderator: Arthur P. Stout, M.D., New York City
11:30 ARTHUR H. SANFORD LECTURESHIP IN PATHOLOGY
"Metabolic Relationship of Potassium, Nitrogen and Sodium."
Paul R. Cannon, Professor of Pathology and Chairman, Department of Pathology, University of Chicago, Chicago, Illinois
P.M.
12:15 Luncheon ....Town House

Afternoon Session

2:00 Tumor Clinic (continued)
Judd Hall, Mayo Clinic, New Building
6:00 Annual Dinner and Business Meeting
Regency Room, Kahler Hotel

WEDNESDAY, MAY 23

P.M.
2:00 Minnesota Academy of Ophthalmology and Otolaryngology..............Mayo Foundation House

"Criteria for Cataract Extraction"
P. J. Leinfelder, Associate Professor of Ophthalmology, College of Medicine, State University of Iowa, Iowa City, Iowa

"Divergence Insufficiency"
T. G. Martens, Rochester

"Retinal Artery Pressures in the Diagnosis of Intracranial Vascular Disease"
R. W. Hollenhorst, Rochester

"Otitic Hydrocephalus"
J. B. McBean, Rochester

"Carcinoma of the Nose and Sinuses"
K. D. Devine, Rochester

"Sudden Deafness of Obscure Origin"
O. E. Hallberg, Rochester

Mayo Civic Auditorium

History of Medicine in Minnesota

THE MEDICAL HISTORY OF RICE COUNTY
(1855-1901)

ADOLPH M. HANSON, M.D.
Faribault, Minnesota

(Continued from January issue)

Faulkner, Lloyd Anson.—Was born in Faribault, September 30, 1862; attended public school there, then went to Shattuck. He studied medicine in Chicago and graduated from Bennett Eclectic Medical College in 1885. He was licensed in Minnesota in the same year (June 6) and started to practice in St. Paul. In 1895 he practiced in Duluth and from about 1898 to 1905 in Good Thunder. In 1909, or before, he located in Lonsdale. About 1914 he returned to St. Paul. Dr. Faulkner was an active Mason, reaching the 32nd degree. He was an ardent collector of curios, especially Indian relics and geological specimens.

He died December 18, 1933, in St. Paul, survived by his widow, Anna, and five children: Lloyd, who became head of the *St. Paul Dispatch* art department; J. F. Faulkner; Mrs. Ernest Ritter of St. Paul; Mrs. F. Armstrong of Minneapolis and Lester Faulkner of Chicago.

Gadbois, Wilfred.—He graduated from the Medical School of the University of Victoria, Canada, in 1887. He was granted his Minnesota medical license on May 11, 1887, and first established his practice in Faribault where he stayed through 1898. He died on January 18, 1912, in Montreal.

Gibson, W. C. (Wm. C.).—Was listed in Faribault in 1890. He was licensed in Minnesota "by examination" December 10, 1886. It is not known exactly when he came to Faribault. In 1895 and 1898 he is listed in Morristown and from 1903 through 1909 in Seattle, Washington. He died on June 8, 1915, at his home in Port Angeles, Washington, at the age of fifty-two.

Goudy.—A Dr. Goudy opened an office in Dundas on August 2, 1876. A local weekly of that date made the following announcement:

> "Dr. Goudy from Illinois has hung out a shingle at R. C. Snyder's where he is prepared to deal out physic to suffering humanity. Dundas is pretty well supplied with M.D.'s at present, there being three practicing physicians here just now."

He was not licensed and nothing more is known about him.

Goulet, John B. A. (also **John** and **J. A. B.**).—Graduated from Victoria College, Montreal, Canada in 1883. He was licensed in Minnesota on March 21, 1885, and in the same year he established his office and residence in Faribault at Third and Elm Streets. He stayed in Faribault only a short time and apparently died before 1890.

Greaves, William.—Practiced in Northfield from 1890 apparently until his death there on June 23, 1907. Dr. Greaves was born in Ontario November 17, 1842, and moved with his parents to Cannon Falls, Minnesota, in 1856. He graduated from the Medical School of the University of Michigan in 1870 or 1871 and was licensed in Minnesota on October 11, 1883.

Hitchcock, Harvey A.—He settled in Springfield, Brown County, Minnesota, in 1878. Born in Courtland County, New York, he studied medicine with a preceptor in Janesville, Wisconsin, and attended a Medical Institute in Cincinnati, Ohio. He removed from Janesville, Wisconsin, to establish a practice at Morristown, Minnesota, and departed Morristown for California in 1881.

Hubbard, E. E.—A graduate of the Minneapolis College of Physicians and Surgeons, he practiced [presumably in Minneapolis] immediately following his graduation in 1894 until 1896, when he went to Faribault where he practiced for two years before moving to Kansas City. There he eventually became the professor of pathology at the Medical Clinic College.

Hunt, William Augustus.—Practiced in Northfield from at least 1890 through 1909. He apparently was born in Northfield in 1858; graduated from the University of Michigan Medical School in 1882 and was licensed in Minnesota December 31, 1883. He was a member of the Minnesota State Medical Association and at one time its third vice president. Dr. Hunt, a gentleman of the "old school," was highly respected and loved in Northfield. He died on January 27, 1921 at Northfield.

Hutchinson, Henry.—A homeopath, practiced in Northfield for four years, 1874 to 1878. He was born in Montreal, Canada, August 20, 1849, and came to Northfield with his parents in 1858. It is said that he started his medical studies under the preceptorship of Dr. A. P. Skeels of Northfield and then went to the Hahnemann Medical College, Philadelphia, from which he graduated in 1874; he started to practice in Northfield in the same year. His Minnesota license he received January 17, 1884. After four years in Northfield Dr. Hutchinson moved to St. Paul in 1878 where in the early 90's he was on the homeopathic board of physicians and surgeons of St. Luke's Hospital. In 1884 he was president of the Minnesota State Homeopathic Institute. From 1901 to 1910 he was president of the State Board of Health and he held a professorship in the Minnesota Homeopathic Medical College. He died in Algiers, Africa, on December 1, 1910.

Huxley, Fredrick R.—A graduate of the Medical School of the University of Minnesota, and now in his eighty-first year and still in active practice here in Faribault where he started his practice in the year 1901, is now the grand old man of our medical profession in Rice County, Minnesota. What Nathan Marvin Bemis was to our profession in his day, Fred Huxley is to it now in our more modern day. A conscientious and highly ethical practitioner all his life and with diagnostic abilities far above the average, even to this date (December 8, 1954), particularly in relation to a correct interpretation of skiagraphs, he is highly respected by all who have the privilege of knowing him. A widower for years and with his two sons middle-aged, he still is active in his office and hospital practice.

He started his practice in Faribault after completing his residency at the Minnesota State School for the Feeble-Minded and Epileptics, and has practiced in Faribault for 54 years.

Jackson, Roscoe Neely.—Settled in Faribault in 1883. He was born in Boonville, N. Y., July 7, 1856. He graduated from the Hungerford Collegiate Institute in 1877 and from the Long Island College and Hospital in 1880.

At a conference called by Dr. H. M. Bracken, secretary of the Minnesota Board of Health, in the office of Dr. Daniel M. Cool during an epidemic of small pox in Faribault, which Dr. Jackson had stubbornly persisted in diagnosing as "Cuban itch," and not small pox at all, Dr. Bracken listened to the arguments, pro and con, for several hours. Getting weary of the long drawn-out discussion and wanting to retire for the night, he suddenly interrupted it by saying:

"Gentlemen! You will *diagnose* this as *small pox*. You will *treat* it as *small pox*. You will *quarantine* it as *small pox*. Or *I* will quarantine your town."

(Told the writer by F. R. Huxley, M.D., of Faribault).

Dr. Jackson established a big practice in Faribault. He had one of the first automobiles—an open single-seat White Steamer with the boiler under the seat, which made the seat too hot for comfort. So Jackson had a stovepipe attached to the compartment under the seat that rose perpendicularly back of it above his head. This outlandish engine scared all the horses in the town and in the country all-around. Everybody knew who Dr. Jackson was. He moved to California when about ready to retire. There he was drowned with a sister-in-law when his automobile went off a bridge into deep water.

Jonson, Norton.—Apparently practiced in Canon City around 1870. Dr. Adelia E. Hutchkiss (Sanderson) a pioneer practitioner in Osakis (Todd and Douglas Counties), supposedly started her medical education in his office.

Juell, N.—This medical doctor came to Red Wing, Goodhue County, in 1893, following postgraduate study in Germany. He had previously practiced in Wisconsin and in Minnesota. He was a member of the Goodhue County Pension Board. In 1897 he moved to Faribault where he practiced medicine and ran a drug store.‡

Kelley, Lewis Halsey.—Physician and journalist, was born in Ovid, Seneca County, New York, on October 3, 1808. He graduated from Geneva Medical College in 1838 and Albany Medical College in 1840. Dr. Kelley came to Minnesota in 1858. He was a respected physician and surgeon at Rochester, Minnesota, from 1857 to 1863. He was also a newspaperman from 1860 up to the time of his death in August, 1872 in Owatonna. He bought the *Rochester City News* in 1860 and changed its name to the *Rochester Republican,* becoming its local editor in 1861 and selling it in 1863. He then moved his printer's equipment to Owatonna where he established that town's first newspaper, the *Plain Dealer*. In 1868 he moved to Northfield and took on the *Northfield Recorder* and, a little later, the *Northfield Enterprise*. In 1870 he moved to Faribault to become the publisher of the *Faribault Leader*. Following his death two years later, a son carried on in his father's place, and a grandson after him.§ (While this gentleman does not rightly belong to a medical history of Rice County, Minnesota, he was a medical man, retired or not, with a high degree of civic consciousness, interested in the welfare of Faribault and so an inspiration to other members of the profession).

Knight, George H.—A graduate of the Medical School of the University of New York City in 1881. He received his Minnesota license on October 13, 1883, and established his practice at Faribault where he was a highly respected member of the medical profession. He stayed there until at least 1890. Between 1895 and 1905 he was in Lakeville, Conn.

---

‡He may be identical with Dr. Niles (also Nils or Nieles) R. H. Juell (or Jewell), a graduate from Rush Medical College who practiced in Becker County in the late 1880's, who was licensed in Minnesota in 1885 and practiced in Goodhue County in the middle 1890's and in Swift County around 1903 and 1905, and who moved to California around 1904.

§See "Medicine and Its Practitioners in Olmsted County Prior to 1901" by Nora H. Guthrey, MINNESOTA MEDICINE, 1949-1951.

Lang.—A Dr. Lang was a partner of Martin L. Mayland for a short time—so short a time, in fact, that his only memory here in Faribault is no more than a faint memory of his surname. Dr. Mayland practiced in Faribault from 1893 to 1937.

Lawrens, Lambert.—His professional card which appeared in the *Faribault Republican* in 1887 read:

> "Lambert Lawrence,
> Physician and Surgeon.
> Office next to Dr. Dale's
> in Theopold block. Speaks
> English, French*, and German."

No other information about him is available.

Leighton, L. W.—This M.D. came to Faribault in the late summer of 1855 or 1856, and vanished like a gentle unnoticed summer's breeze. He opened an office opposite the Brunswick Hotel, but, like the King's men, he marched to the assault and marched right back again.

Lynde, Cornelius V.—Homeopath. Graduate of the Hahnemann Medical College and Hospital of Chicago in 1880 or 1883. He was born in the State of Vermont in the year 1858. He was licensed to practice medicine in Minnesota in 1886 and came Faribault from West Concord, Dodge County, in 1890. He had practiced in other Minnesota towns and villages: Medford, Parkers Prairie, et cetera. He died in a diabetic coma in the Owatonna Hospital on November 27, 1926, as another of those tragic cases of a physician who failed to heal himself. At Faribault he bought the practice of Dr. T. W. Roberts and became his successor. He must have thought that he bought a lemon and learned the bitter lesson that one cannot purchase the confidence of patients with filthy lucre, but must earn it by one's own merit, when he threw it all overboard several years later, perhaps himself already a diabetic and with that handicap, without being aware of it.

Martinez, St. V.—This medical man moved to Northfield from Rochester, Minnesota, in 1879. In 1893 he was practicing in Cedar Rapids, Iowa. He wrote at that time to a friend that he was practicing in that state under the "Time Act" of that state, and that he had been appointed an "Official Counsel of the World's Congress." In 1896 he was listed in a four-state medical directory as a resident of Cedar Rapids, Iowa. His name is not in the 1st edition of the AMA Directory (1906), or later. He was born in Bohemia and arrived in Minnesota in the 1870's. He lived for a few months in Steele County. His professional card in a Rochester newspaper in August of 1874 describes him as an "eclectic physician." He paid a visit to Europe in 1878.

Mattocks, Brewer.—Came to Faribault in 1881 and was still there in 1886 when he had his residence and office at the Corner of Cedar and Hickory Streets.

Dr. Mattocks, one of Minnesota's outstanding physicians, was born in Keeseville, New York on September 12, 1841. He came to St. Paul with his father in 1856. In

---

*As late as the year 1912, approximately one-fourth of the population of Faribault was made up of immigrants from the Canadian Province of Quebec and/or their descendants. They spoke Old French, saying, *vad couche* for *allez couche,* and *il fait fret* for *il fait froid,* et cetera.

1861 he graduated from the Philadelphia College of Pharmacy and in 1864 from a medical college in St. Louis. Between 1861 and 1865 he served in the Civil War as hospital steward and as assistant surgeon. In 1865 he started to practice in St. Paul and continued until 1881. He was one of the founders of the Ramsey County Medical Society in 1870, was on the faculty of the St. Paul School for Medical Instruction (1872) and was very active in the affairs of the Minnesota State Medical Society.

From Faribault he moved to Pittsburgh, Pennsylvania and he retired in 1900. Dr. Mattocks had a fine education and he published a number of poems. He died at the Old Soldiers' Home in the Twin Cities in 1934.

Mayland, Lewis L.—He took care of the practice of his brother, Dr. Martin L. Mayland, while his elder brother, three years his senior was absent from Faribault during the summer of 1896. He was born October 13, 1871, at Kenyon, Minnesota. Before commencing the study of medicine he taught school for two years in northern Minnesota. He graduated in 1896 from the Medical School of the University of Minnesota. He may have stayed with his brother for a while before moving to Hayfield. In 1899 he moved to Red Wing and in 1902 to Bagley, Minnesota. In 1910 he left Minnesota for Chester, Montana, and established himself in Great Falls in 1913. He died in 1942.

Mayland, Martin Lars.—Was born on September 23, 1868, on a farm at Aspelund, Goodhue County, Minnesota, to the Scandinavian immigrants and pioneer settlers Lars A. and Unna Thorsness Mayland. He attended Goodhue County public schools and Carleton College of Northfield. His medical training he received at the Medical School of the University of Minnesota from which he graduated in 1892. During the years at the University he spent all his spare time at weekends and during summer vacation with Dr. Edouard O. Boeckmann of St. Paul and often assisted the latter in his surgical work. He was licensed shortly after his graduation and he started to practice in Mankato. After only a year there he moved to Faribault to establish himself permanently.

Avid for further training, he graduated from the Post-Graduate Medical School of New York in 1893 and took an intensive course of six weeks in operative surgery at McGill University, Montreal, in 1895.

When he arrived in Faribault he had an unsually complete set of surgical instruments for that time, a team of horses, a buggy, a good fur coat and one thousand dollars. There he found a number of physicians, but no hospital. Being a surgeon at heart and of a not too healthy constitution he sorely missed the hospital and he became instrumental in the founding in 1895 of the Hunter Hospital in Faribault—ironically almost adjoining the cemetery on the western outskirts of the town. There he performed the first operation and did most of the surgery during its existence of eleven years. It was closed in 1906.

It was at this hospital that he met Josephine Olivette Sullivan. Miss Sullivan had graduated from the Minneapolis General Hospital Training School for Nurses in March, 1901, and only a few days later became supervisor of the Hunter Hospital. They were married on November 30 of the same year. She continued to assist him as nurse and anesthetist especially during the period of more than two years between the closing of Hunter Hospital and the opening of St. Luke's Hospital on May 16, 1909, when all surgery had to be carried out in homes. His and his nurse's painstaking care in preparing a room for operation and his meticulous surgical procedures resulted in healing by primary intention of all his clean cases during this period —and there were over 300 operations, mostly of a major type.

Dr. Mayland practiced surgery in Rice County for over forty-four years. He had a suave and pleasingly dignified personality, was sympathetic, kindly, but firm and uncompromising when occasion demanded it. He died on November 16, 1937, in his seventieth year in a Rochester Hospital of Hodgkin's Disease. He was survived by his wife, a son, Martin L. Mayland of St. Louis, Kentucky; his brother, Dr. Lewis L. Mayland of Great Falls, Montana; and two sisters. The Maylands had lost one daughter.

Dr. Mayland had been prominent in civic and political affairs. During his last twenty-five years he served three terms as county coroner; he held this position for six years prior to his death. For several years he was city health officer of Faribault. His work in the establishment of Hunter Hospital has been mentioned; he also took an active part in the establishment of St. Luke's Hospital. During World War I he was a member of the volunteer service corps; he was drafted and prepared for active service when the war ended. He was a member of the Rice County Medical Society, the Southern Minnesota Medical Association, the Minnesota State Medical Association and the American Medical Association. Dr. Mayland was an active member of the Congregational Church and was exalted ruler of the Faribault Lodge B.P.O.E.

Morbeck, Zacharias.—This medical man was listed as practicing the healing art in Northfield in 1893. He was not licensed in Minnesota and nothing more is known about him.

Nelson, Louis F.—Graduate of the Medical School of the University of Maryland in 1849. Licensed to practice in Minnesota on November 12, 1883. He, too, was one of many, who came to Faribault and went on, again, like a ghost ship passing in the night.

Nichols (or **Nicholas**), **B.**—A homeopath. He was one of the sixteen signers of the articles of the Association of the Minnesota State Homeopathic Institute at the Globe Hotel in St. Paul in 1867. He settled in St. Paul in 1852. He moved to Northfield in 1853 and later became a physician to the Minnesota Institute for the Education of the Deaf, Dumb and Blind, which opened in Faribault in 1863. He was elected president of the Minnesota State Homeopathic Association in 1873. He was reported as practicing in Portland, Oregon, in 1882.

Orcutt, Isaac Hall (also **I. H. Orcutt** and **Hall Orcutt**).—He came to Northfield in 1896 and stayed there until his death in 1912. This part of his life was spent doing research on Alcohol and Tobacco, and lecturing about them to the Women's Temperance Union in various towns in Minnesota and Iowa. He served on the Town School Board of Northfield for several years and was engaged in overseeing certain properties of his own in various parts of the State. He died in Northfield on October 7, 1912, in his sixty-sixth year, of Bright's disease, survived by his second wife (the first had died in 1884), a son and a daughter. He was buried in Oaklawn Cemetery, Northfield.

Dr. Orcutt was born on June 7, 1847, near Westmoreland, Oneida County, in the State of New York. In 1866 he studied at Groveland Seminary at Wasioja. Then he taught in the school of his boyhood in Concord Township. It seems that he started the study of medicine with a private physician as preceptor but then went to the Chicago Medical College from which he graduated on March 21, 1876. Immediately he began to practice in Byron, Olmsted County. In April, 1879, he left to take a course of natural sciences at the University of Pennsylvania and received a degree of doctor of philosophy before he returned to his practice in June, 1880. Poor health caused him to restrict his medical work to office practice and early in 1883 he retired to a farm. In 1884 he moved to the Dakota Territory, where after two years of medical practice he was appointed professor of natural sciences at the Dakota Agricultural College, also as college physician. It seems it was during these periods that his special interest in ill effects of alcohol and tobacco on the nervous system developed. In 1893 he moved to Owatonna where in the following year he published a small book, *Microbes and Men*. As mentioned, in 1896 he moved to Northfield.**

Pentz, F. C. F.—Born in Hanover, Germany, on January 20, 1823. He received an education at the high school, and in 1841-1842 served in the Prussian army. In 1846, he entered Göttingen Medical Institute, but did not take a full course. He returned to the Prussian army in 1848. He came to the United States in 1850. In 1855 he married Miss Rebecca Abbott, a native of Indiana. One year later he removed to Minnesota, but did not settle permanently in the state until the year 1867. The History of Rice County (1882) goes on to state: "Mr. Pentz has practiced as a physician part of the time since coming to this country." He was in Northfield from 1881 to 1882.

Phillips, John Rutledge.—Practiced in Northfield for over twenty years—until one year before his death. He graduated from the Medical School of the University of Victoria, Montreal, Canada, in 1884 and came to Minnesota in the same year, where he was licensed on November 10. He first practiced in Dundas and moved to Northfield in the early 1890's. Because of illness he left Northfield about a year before his death. The last six months he spent at the Presbyterian Hospital in Chicago suffering from a heart condition. He died on September 2, 1912. He was representative, in 1909, in the Legislature.

For fifteen years he served on the United States Pension Examining Board in Northfield. He was a member of all Masonic Lodges, the Knights Templars and Osman Temple of St. Paul.

It is said that Dr. Phillips came to Dundas completely without funds—all he had was his medicine bag. At first he walked for miles to visit his patients, but after a while secured snowshoes. Later he made calls on horseback and finally was able to have a horse and buggy. He was known as a genial man, beloved by his patients and friends. When he moved to Northfield he soon was a successful physician. Dr. Philips never married.

In 1906 he was joined in Northfield by his nephew, Dr. John Gilbert Phillips. The latter was born at Drumbo, Ontario, January 7, 1877, and came to the United States at the age of 11 with his parents who settled in Marlette, Michigan. He graduated from Northwestern University in 1905. After about a year with the Lenont Clinic at Virginia he came to Northfield to join his uncle. This association lasted several years. Dr. John Gilbert Phillips practiced a total of about sixteen years in Northfield and died there November 22, 1922, at the age of forty-five. His widow, Nellie W. Phillips, still lives in Northfield (1955).

Pillsbury, Charles.—He was the homeopath partner of Dr. D. H. Roberts of Owatonna in 1898. He came from Duluth, where he had practiced for eleven years. He practiced in Faribault (1898-1900) and then returned to Duluth.

(To be continued in the July issue)

**See the extended biography in "Minnesota and Its Practitioners in Olmsted County Prior to 1900" by Nora H. Guthrey, MINNESOTA MEDICINE, 1949-1951.

Meetings and Announcements

MEDICAL MEETINGS

State

MINNESOTA STATE MEDICAL ASSOCIATION, annual meeting, Mayo Civic Auditorium, Rochester, May 21-23, 1956.

Northwest Pediatric Society, spring meeting, Rochester, May 22, in conjunction with meeting of Minnesota State Medical Association. Secretary, Dr. T. C. Papermaster, Minneapolis.

National

American Association of Blood Banks, ninth annual meeting, Somerset Hotel, Boston, Massachusetts, September 3-5. Secretary Marjorie Saunders, 725 Doctors Building, 3707 Gaston Ave., Dallas, Texas.

American Cancer Society and National Cancer Institute, Third National Cancer Conference, Sheraton-Cadllac Hotel, Detroit, Michigan. June 4-6. Write National Cancer Conferences Coordinator, American Cancer Society, 521 West 57th Street, New York 19, New York.

American College of Physicians, 37th annual session, Los Angeles, California, April 16-20.

American Ophthalmological Society, Hot Springs, Virginia, May 31 to June 2.

Medical Library Association, fifty-fifth annual meeting, Hotel Statler, Los Angeles, California, June 18-22. Write Mrs. Ella Crandall, Libraian, Los Angeles, County General Hospital, 1200 North State Street, Los Angeles 33, California.

Microbiological Institute, ninth annual meeting, Department of Biological Sciences, Purdue University, Lafayette, Indiana, June 4-9. Write Division of Adult Education, Engineering Administration Building, Purdue University, Lafayette, Indiana.

Symposium for General Practitioners on Tuberculosis and Other Chronic Pulmonary Diseases, fifth annual meeting, Saranac Lake, New York, July 7-13. Dr. Edward N. Packard, general chairman, Symposium for General Practitioners, P.O. Box 262, Saranac Lake, New York.

Third National Cancer Conference, Detroit, Michigan, une 4-6.

International Meetings

Canadian Medical Association, Quebec, Canada, June 10-14. Secretary, Dr. Arthur D. Kelly, 150 St. George St., Toronto, Ontario, Canada.

Congress of International Society of Hematology, Hotel Somerset, Boston, Massachusetts, August 27 to September 1. Secretary, Dr. W. C. Maloney, 39 Bay State Road, Boston, Massachusetts.

Inter-American Congress of Cardiology, Havana, Cuba, November 4-10. Write Dr. Ramon Aixala, Apartado 2108, Havana, Cuba.

International Congress of Clinical Chemistry, Hotel New Yorker, New York, September 9-14. Secretary, John G. Reinhold, 711 Maloney Building, University of Pennsylvania, Philadelphia 4, Pennsylvania.

World Medical Association, Havana, Cuba, October 9-15. Secretary, Dr. Louis H. Bauer, 345 E. 46th St., New York 17, New York

Pan American Congress on Cancer Cytology, Miami, Florida, January 8-12, 1957. Dr. J. Ernest Ayre, chairman, 1155 N. W. 14th St., Miami, Florida.

European Congress of Cardiology, Stockholm, Sweden, September 10-14. Dr. Karl E. Grewin, secretary, Sodersjukhuset, Stockholm, Sweden.

International Congress on Diseases of the Chest, Cologne, Germany, August 19-23. Murray Kornfeld, executive director, 112 East Chestnut St., Chicago 11, Illinois.

International Congress of Gastroenterology, London, England, July 18-21. Herman Taylor, secretary, London Hospital, White Chapel, London E. 1, England.

International Congress of Internal Medicine, Madrid, Spain, September 19-23. Dr. J. C. DeOya, secretary, No. 90, Madrid, Spain.

International Congress of Radiology, Mexico, D. F., Mexico, July 22-28. Dr. Jose Noriega, secretary, Tepic 126 (2 e piso), Mexico, D. F. 7, Mexico.

International Congress of World Confederation for Physical Therapy, Statler Hotel, New York, New York, June 17-23 Mildred Elson, American Physical Therapy Association, 1790 Broadway, New York 19, New York.

MINNESOTA ACADEMY OF OPHTHALMOLOGY AND OTOLARYNGOLOGY

The Minnesota Academy of Ophthalmology and Otolaryngology adopted the following resolution at its February meeting in Saint Paul with respect to professional association between optometrists and physicians:

"The Minnesota Academy of Ophthalmology and Otolaryngology is officially opposed to the professional association of optometrists and physicians practicing in this state; and that a copy of such official action be placed in the hands of every member of the Minnesota State Medical Association.

"The term 'professional association' indicates the joint office practice of a physician and optometrist for the purpose of diagnosing or treating eye diseases; and (or) the examination for, or prescribing of, eye glasses."

MINNESOTA SOCIETY OF NEUROLOGY AND PSYCHIATRY

Principal speaker at a meeting of the Minnesota Society of Neurology and Psychiatry in St. Paul on March 13 was Dr. Irving C. Bernstein, who presented an inaugural thesis entitled, "Psychiatric Aspects of Dysmenorrhea." The paper was discussed by Dr. John L. McKelvey.

MEDICLINICS OF MINNESOTA

Mediclinics of Minnesota, a clinical lecture course, was held at Fort Lauderdale, Florida. from March 5 to 14. Lectures and panel discussions were presented every weekday morning and late afternoon. Members of the faculty for the course included Dr. Harold F. Buchstein, Dr. Harry B. Hall, Dr. Arthur C. Kerkhof, Dr. Ames W. Naslund, Dr. O. L. Norman Nelson, Dr. Owen F. Robbins, Dr Albert V. Stoesser, Dr. Robert J. Tenner, Dr. Richard L. Varco and Dr. Edgar A. Webb.

ST. PAUL SURGICAL SOCIETY

The St. Paul Surgical Society will meet at the Minnesota Club, St. Paul, on April 18, with dinner at 6:00 p.m. and scientific session at 8:00 p.m. Dr. John McLean will discuss "The Conservation of Ovarian Tissue."

MINNEAPOLIS SURGICAL SOCIETY

The next meeting of the Minneapolis Surgical Society will be held at the Calhoun Beach Hotel on May 3, with dinner at 6:00 and scientific session at 8:00 p.m. Principal speaker will be Dr. Ernest Lampe of Cornell University.

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY

Applications for certification by the American Board of Obstetrics and Gynecology for the 1957 Part I examinations are now being accepted. Application for re-examination, as well as requests for resubmission of case abstracts, must be made before October 1, 1956. All communications should be sent to the secretary, Dr.

CRIPPLED CHILDREN SERVICES SPRING CLINIC SCHEDULE

The Crippled Children Services spring clinics are now being held at various cities in Minnesota. Clinics have been held at Cloquet, Grand Rapids, St. Cloud, Albert Lea, Hibbing and Faribault. Forthcoming clinics are listed below:

**Gaylord	April 25	Le Sueur, Brown, Nicollet, Carver, Scott, McLeod, Sibley
*Worthington	April 28	Cottonwood, Nobles, Jackson, Pipestone, Murray, Rock
*Detroit Lakes	May 5	Becker, Mahnomen, Clay
*Thief River Falls	May 12	Kittson, Red Lake, Marshall, Roseau, Pennington
**International Falls	May 18	Koochiching, Lake O'Woods
*Brainerd	May 26	Crow Wing, Wadena
*Morris	June 2	Bigstone, Pope, Douglas, Stevens, Grant, Traverse

*County Welfare Board Social Service for clinic intake arranged by Field Representative. All *new* patients are requested to bring written referrals from their family physician.

**Social problems arising at clinic will be referred to County Welfare Board on day of clinic. In-take service *not* necessary from County Welfare Board. New patients are requested to bring written referrals from their family physicians. *All* patients should have appointments arranged through local Public Health Nurses.

Note: Gillette State Hospital patients will not be attending *any* orthopedic field clinics.

CONTINUATION COURSES AT THE UNIVERSITY OF MINNESOTA CENTER FOR CONTINUATION STUDY

Dates		
May 7-12	Electrocardiography for General Physicians	Dr. Harold Levine Harvard University Medical School
May 14-19	Proctocology for General Physicians	
May 24-26	Surgery for Surgeons	Dr. Robert M. Zollinger Ohio State University College of Medicine
June 4-6	Dermatology for General Physicians	

Woman's Auxiliary

N AREA PLAN

Irs. L. R. Boies

A large and growing auxiliary presents problems which ust be recognized. The membership of the Auxiliary the Hennepin County Medical Society has experienced rapid growth in the past few years, but the attendance meetings and group participation in our activities mains fairly constant. An appraisal of the situation d re-evaluation of the Auxiliary's intent is imperative.

One objective which we must constantly keep in sight this: to accomplish what we plan requires the en- usiasm and support of every individual member—in er lies the life of our organization. She must be mind- l of her membership, which is unique. Our program a broad one, and we want every member to feel that e is an important cog in a community group of omen banded together to further the ideals of a highly spected profession—medicine.

Present-day problems must be recognized, also. Young- women, our leaders tomorrow, are finding permanent elp in the home almost a legend of the past. As a sult, activity outside the home that offers them what ey want takes priority. Traffic problems and con- ested parking problems have eliminated late afternoon eetings. The trend is toward morning or mid-day atherings.

With these facts in mind, and with the added prob- m of a rapidly growing organization where we find urselves at meetings in a sea of unknown faces, we ave devised what we hope is a workable plan. It has mitless potentialities if carefully directed.

At the beginning of our year, the Auxiliary to the ennepin County Medical Society inaugurated the area lan, dividing its membership into small groups accord- g to the neighborhood in which each member lives. In is way, individuals experience a more personal rela- onship with other members and become better acquaint- d. From the organizational point of view, the large, nwieldy group becomes more manageable and there a closer contact with each member.

This idea is not a new one; it has proven successful n two occasions. In the spring of 1941, our benefit r fund raising was operated successfully under such plan. In the fall of 1953, it was used for simultaneous vil defense meetings. Echoes of "let's have more of ese friendly, intimate gatherings" were heard.

Since the groundwork for the plan was available om this earlier civil defense experience, the same oundaries for the areas have been maintained. Because e had followed the same pattern, it was very simple correlate auxiliary civil defense work with that of e Medical Society Civil Defense Co-ordinator, Dr. Carl . Waldron, for whom we are doing a project.

The Auxiliary has been divided and combined into n groups. Where the medical population was sparse, everal zones were combined, but each part has kept s identity. Each group has a chairman directly responsible to the area chairman who is a member of the Board of Directors. When a new member joins the Auxiliary, her name is sent to the area chairman who then places her in her respective group. A close follow-up by the group chairman becomes a welcoming gesture.

A purposeful goal is a prerequisite in any undertaking. This year's area projects have been to complete questionnaires on every member in the Auxiliary and to promote closer human relationships among physicians' wives. The latter was done by having simultaneous morning "Kafe Klatsches" in each area on our regular meeting day in January. The clamorous enthusiasm for more of these gatherings gave proof of this successful venture.

Representation according to areas has been worked out on the Hospitality and Fund Raising Committees. Incorporating the Telephone Committee into the area organization would have been extremely beneficial. The area designation for each member in our yearboook would also be most advantageous.

This earnest endeavor to further friendliness, understanding and "oneness" gives to a very large membership that feeling experienced in smaller auxiliaries.

REPORT ON MID-WINTER BOARD MEETING

Mrs. L. J. Leonard

The Mid-Winter Board meeting, held at the Minnesota Club in Saint Paul, Thursday, February 9, at 10:00 a.m., was called to order by Auxiliary President Mrs. H. H. Fesler. Following roll call and reports of officers and regional advisors, committee chairmen brought out many interesting statistics and suggestions.

Mrs. M. I. Hauge, chairman of Allied Medical Careers, has available an interesting new book for use of future nurses' clubs. She feels these clubs need sponsors to further acquaint them with facts pertaining to the profession.

Mrs. P. J. Pankratz, of Mountain Lake, announced that she and Dr. Pankratz are leaving Minnesota in April for a four-year assignment in Formosa, where he will have charge of a hospital. Goodbyes were said with a tinge of sadness, as she has been a loyal worker and her absence will certainly be felt. Auxiliary members wish them God-speed in their new undertaking.

Legislation offers many challenges, according to Mrs. Philip Arzt of Saint Paul. Members should particularly keep informed on H.R. 7225, regarding amendments to the Social Security Act, and the Jenkins-Keough Bill. To be well informed on legislative matters, members are urged to read the *Bulletin,* which contains current authentic data. Also reference to the column on Medical Economics in the February issue of MINNESOTA MEDICINE will prove beneficial.

Mrs. E. S. Mariette, Wayzata, urged that the auxiliary co-sponsor Mental Health Week, April 29 to

May 5. Therapy for the patient and a better understanding of the patient's problem can completely change the picture, as it did in the state of Kansas, but money has to be spent before it can be saved: an educational program is being promoted for this purpose. The assembly voted to co-sponsor this program along with the Junior Association of Commerce and the Federation of Women's Clubs.

Mrs. W. T. Greenfield, Cokato, stated that a list had been compiled of the various medicines desirable for shipping: this will be a great help to the chairmen assembling surplus drugs which they have collected from the doctors' offices. She also has a list of agencies and foreign hospitals, where these supplies are needed, and it is available to anyone desiring it.

Mrs. L. P. Howell, Rochester, gave a stimulating synopsis of the convention of presidents and presidents-elect in Chicago. She recommended reading in full Dr. Ernest B. Howard's speech to this assembly, a copy of which may be found in the January *Bulletin*.

Every auxiliary is requested to sponsor one safety program a year. Mrs. Charles Merkert, Minneapolis, suggested co-operating with the national auxiliary in promoting its new project "Gems" (Good Emergency Mother Substitute). A new series titled "Baby Time," which concerns baby sitters, will be seen on KSTP-TV on Tuesday and Thursday at one o'clock. She also recommended a new booklet, "You're in Charge," for distribution where needed.

American Medical Education Week will be April 22 to 29, according to Mrs. John Dordal, Sacred Heart. She suggested memorials and "In appreciation" cards to help swell this fund. A new book, "Face Facts," and a new film, "Danger at the Source," are both recommended as aids to a better understanding of this matter.

A new mental health kit, available through the AMA for 50 cents, should be in the hands of every auxiliary chairman, is the opinion of Mrs. William Gjerde of Lake City. She also suggested that members endeavor to work with local Chamber of Commerce groups when presenting programs to interest lay people.

It was a pleasure to see Mrs. William Ferguson, Walnut Grove, new president of the Lyon-Lincoln Auxiliary. Her secretary is Mrs. R. R. Remberg, Tracy. Congratulations to this newly formed auxiliary.

County presidents had items of interest to report. Mrs. F. T. Becker, Duluth, reported earning $400 at a rummage sale. The St. Louis County Auxiliary also sponsored a Glaucoma Detection Day. Mrs. Andrew Sinamark, Hibbing, said the Iron Range Auxiliary periodically gives awards to nurses during training upon completion of a specified number of hours of service. Mrs. Karl Walfred, St. Cloud, reported that more than 100 junior and senior high school girls from Foley, Cold Spring, and St. Cloud attended their nurse recruitment tea on February 7, which included a hospital tour, a panel discussion and showing of the film, "Nurses in White."

Dr. James Rogers Fox, radio and television director for the Minnesota State Medical Association, spoke on "The Doctor's Place in the Community." Polls show doctors at the top of the list as far as individual esteem is concerned, though they do not always occupy this position from a financial standpoint and by the amount of community work they do. It is much more difficult to attain a medical degree today than it was ten years ago, and the average age before a graduate entering a specialty field is ready to practice is thirty. Doctors generally err by not entering into public activity; they should live in a total society, not just in the office and the hospital.

Mr. Harold Brunn, assistant executive secretary of the State Medical Association, spoke on the American Medical Education Foundation, and said there were eighty-one approved medical schools, private and public, in the country. Ten million dollars is needed annually to supplement the income the Foundation now has. The new "Eighty Dimes" promotion for AMEF should not be a door-to-door canvas; contributions should be solicited only within one's own family and medical group. Always check with your county society before taking action on any matter and be sure that it is approved by the Council.

The Rochester Auxiliary invited all Auxiliary members to attend the State Convention in that city, May 21 to 23. The national convention will be in Chicago, June 11 to 13.

A special thank-you to the hostesses for the day—Mrs. Wallace Ritchie and Mrs. J. R. Meade, both of Saint Paul, who were in charge of arrangements.

The Food and Drug Administration has announced that the evidence of record does not warrant removal of the hypnotic drugs acetyl carbromal and bromural from the list of drugs required by federal law to bear the label statement: "Warning: May be Habit Forming."

This decision was made on the basis of evidence received at public hearings held on June 7 and September 13, 1955. A summary of the evidence and a proposed order have been published in the Federal Register. Interested persons who appeared at the hearings are privileged to file exceptions to the tentative order with specific references to the pages of the transcript of testimony or to exhibits on which the exceptions are based.

THE PRESENT STATUS OF THE TREATMENT OF VARICOSE VEINS

(Continued from Page 229)

9. Buxton, R. W.: Farris, J. M.: Moyer, C. A., and Coller, F. A.: Surgical treatment of long standing deep phlebitis of the leg. Surgery, 15:749-756, 1944.
10. Bauer, G.: The patho-physiology and treatment of the lower leg stasis syndrome. Angiology, 1:161-169, 1950.
11. Murphy, T. O.: Department of Surgery, University of Minnesota. (Unpublished data).
12. Scott, H. W., and Roach, J. F.: Phlebography of the leg in the erect position. Ann. Surg., 134:104-109, 1951.
13. Felder, D. A., and Murphy, T. O.: The evaluation of a method of phlebography of the lower extremities. Surgery, 37:198-205, 1955.
14. Felder, D. A.; Murphy, T. O., and Ring, D.: A posterior subfascial approach to the perforating veins of the lower extremitiy. Surg., Gynec., & Obst. (published).

In Memoriam

FREDERICK GAY CARTER

Dr. Frederick G. Carter, superintendent of Ancker Hospital, Saint Paul, from 1924 to 1935, died February 19, 1956, in Cleveland. He was sixty-seven years of age.

Dr. Carter served as president of the Minnesota Hospital Association and the American College of Hospital Administrators. He was a member of the Ramsey County Medical Society and the Minnesota State Medical Association.

He became administrator of Christ Hospital in Cincinnati after leaving Ancker, and in 1939 he went to St. Luke's Hospital in Cleveland.

EDWARD A. COLP

Dr. Edward A. Colp, a physician in Robbinsdale, Minnesota, for twenty-eight years, died February 10, 1956, while vacationing on the gulf coast aboard the *S.S. Monarch of the Seas.* He was fifty-five years old.

A native of Fargo, North Dakota, Dr. Colp graduated from Tufts Medical School, Boston, Massachusetts.

He was a member of the Hennepin County Medical Society, the Minnesota State Medical Association, the American Medical Association and Phi Chi medical fraternity.

Dr. Colp served as a commander in the Navy during World War II.

Surviving are his wife, Hazel A.; a son, Richard Kolling, Minneapolis; a daughter, Mrs. Robert Corrigan, Northfield, Minnesota; his stepmother, Mrs. Utta Colp, Miami, Florida; a brother, Donald Gray, Jr., Tucson, Arizona; a sister, Mrs. Robert D. Chellis, Weston, Massachusetts, and a stepsister, Mrs. Donald G. Burch, Saint Paul.

ALLAN FRANCIS GIESEN

Dr. Allan F. Giesen, physician and surgeon of Starbuck, died January 26, 1956, in Minneapolis. He was ifty-two years old.

Born in Groton, South Dakota, Dr. Giesen settled in Starbuck after graduating from the medical school of he University of Minnesota and served his internship at Ancker Hospital, Saint Paul, and Detroit Receiving Hospital.

Dr. Giesen was a member of the West Central Minneota Medical Society, the Minnesota State Medical Association, the American Medical Association, and Alpha Omega Alpha and Phi Chi medical fraternities.

He was very active in community affairs as a member of the Starbuck Commercial Club, chairman of the Pope County Republican Committee, and chairman of the chool board. He served on the Village Council and as mayor in 1934-35.

During World War II, he attained the rank of Commander in the U. S. Navy, seeing action in both the European and Pacific theatres. He was active in both he American Legion and the Veterans of Foreign Wars.

Dr. Giesen is survived by his wife; three sons, John, Philip, and Allan; three daughters, Allene, Toni and Kathi; his brother Earl, Delano; and his sister, Gertrude Giesen, Brigham City, Utah.

WALTER N. LEE

Dr. Walter N. Lee, Madison, Minnesota, physician for thirty-five years, died January 28, 1956, in Claremont, California. He was sixty-eight years old.

A native of Minneota, Minnesota, Dr. Lee graduated from the University of Illinois College of Physicians and Surgeons, and practiced from 1909 until 1914 in Mayville, N. D. He then moved to Madison, remaining there until 1949. At that time the family moved to California.

Dr. Lee was a veteran of World War I and was a member of the American Legion post in Madison. He was a member of the Madison Masonic lodge and of the Scottish Rite in Minneapolis. He was also a member of the Camp Release County Medical Society and the Minnesota State Medical Association.

Survivors include his wife; a daughter, Mrs. J. L. Armstrong, Cincinnati Ohio, and three sisters.

BERT G. LEVIN

Dr. Bert G. Levin, Saint Paul eye, ear, nose and throat specialist, died February 9, 1956. He had been with the Earl Clinic for twenty-eight years.

Dr. Levin was born at St. James, Minnesota, in 1899. He graduated from the medical school of the University of Minnesota in 1924 and interned at Minneapolis General Hospital. He was a member of the staff at Midway and Mounds Park Hospitals.

A member of the Ramsey County Medical Society, the Minnesota State Medical Association and the American Medical Association, Dr. Levin was also a fellow of the American College of Surgeons and a member of the American Academy of Otolaryngology.

Dr. Levin was on the board of Mount Zion Temple and was a past president of B'nai B'rith.

He is survived by his wife; two daughters, Susan and Jane; two brothers, Dr. Alfred Levin of Miami and David Levin of Grand Rapids, Michigan, and a sister, Mrs. Isadore Simon of Birmingham, Alabama.

DAVID POTEK

Dr. David Potek, Minneapolis, died January 11, 1956. He was fifty-one years old.

At the time of his death, Dr. Potek was on the staff of the Cambridge State Hospital, Cambridge, Minnesota. He was previously on the staff of the Glen Lake Sanatorium at Oak Terrace.

Born in Brailov, Russia, Dr. Potek graduated from the University of Minnesota medical school. He practiced medicine at International Falls, Minnesota, for a number of years and served with the army medical corps during World War II.

He was a member of the East Central Minnesota Medical Society and the Minnesota State Medical Association.

Survivors include his wife, Lillian; a daughter, Louise, and two sons, Arnold S. and Jason.

GEORGE E. SENKLER

Dr. George Senkler, Saint Paul physician for more than fifty years, died February 4, 1956. He was eighty-six years old.

Born in St. Cloud, Dr. Senkler attended the University of Minnesota and the University of Pennsylvania. He was a partner in the Miller Clinic and was associated many years with St. Luke's Hospital.

He was a member of the Ramsey County Medical Society and a life member of the Minnesota State Medical Association. He was also a "Fifty Club" member.

Mrs. Abigail Senkler, his wife; Mrs. J. Fuller Brown of Newport News, Virginia, his daughter, and seven grandchildren are survivors.

WALTER HERMAN UDE

Dr. Walter H. Ude, Minneapolis radiologist, died of a heart attack February 10, 1956, while he and Mrs. Ude were vacationing in Hawaii. He was fifty-nine years old.

A native Minnesotan, born in Vernon City in 1896, Dr. Ude graduated from the University of Minnesota. He interned and studied roentgenology at Minneapolis General Hospital. He had practiced in Minneapolis for thirty years, and was senior partner in the firm of Ude, Borman, Ahern and Stone.

Dr. Ude was a clinical professor of radiology at the University of Minnesota medical school. Recently, he was elected vice president of the Radiological Society of North America.

Dr. Ude was an active member of the Minnesota State Medical Association, serving in the House of Delegates and as a member of the Committee on Tuberculosis. He belonged to the Hennepin County Medical Society, the American Medical Association, the American Roentgen Ray Society, the American College of Radiology and Alpha Omega Alpha, honorary medical fraternity.

He was a diplomate of the American Board of Radiology, a veteran of World War I, a member of the Minneapolis Club and the Thirteen Club.

Survivors include his wife, Valborg; two brothers, August, Minneapolis, and Arthur, Saint Paul; and three sisters, Mrs. Anne Peterson, Spring Valley, Minnesota, Mrs. Doris Tonsing, Dallas, Texas, and Mrs. Clara Halsey, Terrell, Texas.

IRVING GEORGE WILTROUT

Dr. Irving G. Wiltrout, born November 22, 1885, in Hudson, Wisconsin, died February 1, 1956, in Oslo, Minnesota, where he began his practice in 1920.

Dr. Wiltrout studied medicine at the Wisconsin College of Physicians and Surgeons and practiced in Swanville, Minnesota, for a few years before serving in the medical corps during World War I.

Dr. Wiltrout was prominent as a civic leader in Oslo, serving as mayor and as a member of the Board of Education. He was area health officer and was the Marshall County Draft Board Medical Officer. He was instrumental in building the Oslo War Museum and spent much time directing the exhibits.

He was a member of the Red River Valley County Medical Society, the Minnesota State Medical Association and the American Medical Association.

Dr. Wiltrout is survived by his wife; two daughters, Mrs. Robert Dryden of Atlanta, Georgia, and Mrs. James Ritchie, Chicago, Illinois; a sister, Florence Wiltrout, Chippewa Falls, Wisconsin, and two grandchildren.

Burial was at Fort Snelling National Cemetery in Minneapolis.

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

(Continued from Page 245)

Rice County Jail on May 19, 1955, and was not apprehended until July 16, 1955, when he was arrested in Minneapolis. Lawton was therefore also charged with the crime of escape from jail and on February 8, 1956, he entered a plea of guilty to this charge and also to the information charging him with having four prior convictions for felonies. For the crime of escape the defendant was sentenced by Judge Anderson to a term of three years in the Minnesota State Prison, the sentence to run concurrently with the fifteen-year sentence.

In the grand larceny case, the defendant was charged with issuing without funds a $50.00 check on or about August 31, 1954, which he signed "R. Thayer Lawton, M.D., White Bear Lake," and representing that he was a doctor of medicine to a Faribault man, who cashed the check. It was alleged that the defendant knew at that time that he was not a doctor of medicine and that he had no funds on deposit at the bank. After he escaped from jail in Faribault, Lawton continued to represent himself as a doctor of medicine under an assumed name in Minneapolis. On July 14, 1955, it was reported to the Minnesota State Board of Medical Examiners that a "Dr. Jones," falsely representing himself as a teacher in pathology at the University of Minnesota, had issued two checks in Minneapolis without funds for a total of $25,025.00. When "Dr. Jones" was apprehended two days later in Minneapolis he proved to be Lawton. Lawton has no medical training and is not licensed to practice any form of healing in Minnesota.

Lawton has two prior convictions for felonies in the District Court of Hennepin County as follows: On January 7, 1926, he was convicted of forgery and sentenced to a term of not to exceed 5 years in the State Prison at Stillwater. He was sentenced on March 16, 1949, to an indeterminate term of not to exceed 7 years in the same institution on a grand larceny charge. The defendant was also convicted on March 24, 1928, in Federal District Court in St. Paul of forging an endorsement of a United States obligation and sentenced to 10 years in the United States Penitentiary at Leavenworth. Ten years later, on March 7, 1938, Lawton was convicted of grand larceny in the District Court at Libby, Montana, at which time he was sentenced to 2 years in Deer Lodge Penitentiary, Deer Lodge, Montana

General Interest

Dr. Robert A. Good, American Legion heart research professor at the University of Minnesota, spoke on "Progress in Heart Research" at a meeting of chairmen of the Twin Cities Heart Sunday in Minneapolis on February 11.

* * *

Dr. Allan J. Blake has been elected chief-of-staff of Doctors Memorial Hospital, Minneapolis. Named as associate chief of the medical staff was **Dr. R. H. Beiswanger**, with **Dr. Fred A. Rice** as secretary-treasurer.

* * *

At a meeting of the board of governors of the American Fracture Association in Chicago recently, **Dr. H. W. Meyerding**, Rochester, was elected permanent honorary president of the organization. Dr. Meyerding helped to organize the group several years ago and served as its president for the past three terms. He also was recently renamed U. S. delegate and chairman of the national committee of the International Society of Orthopedic Surgery and Traumatology, which he helped to found in 1929.

* * *

Dr. J. S. Blumenthal, clinical associate professor of medicine and chief of the allergy clinics at the University of Minnesota, presented a talk on allergy at a continuation course for the Clinical Dietetics Institute on March 1.

* * *

Dr. Frank G. Hedenstrom, who retired from service with the Child Health Clinic in St. Paul at the start of the year, was honored February 8 at the annual meeting in St. Paul of the Family Nursing Service. **Mrs. John C. Parish**, president of the group, presented Dr. Hedenstrom with a plaque in recognition of his services to the clinic, with which he was associated for thirty years.

* * *

Dedication ceremonies for **St. John's Hospital** at Browerville were held on February 26. The ceremonies were conducted by Bishop Peter W. Bartholome of St. Cloud. The hospital will be operated under the auspices of the Sisters of St. Benedict, Crookston.

* * *

Dr. Robert N. Barr, secretary and executive officer of the Minnesota Department of Health, presented a talk at a general staff meeting at the Rochester Health Center on February 23.

* * *

On the program at a sectional meeting of the American College of Surgeons in Colorado Springs, Colorado, March 5 to 7, was **Dr. H. Waltman Walters**, Rochester, who discussed operative and postoperative cholangiography.

* * *

Dr. Cecil J. Watson, chief of internal medicine at the University of Minnesota, has been named president of the Minnesota chapter of the Arthritis and Rheumatism Foundation. He succeeds **Dr. Charles H. Slocumb**, Rochester, in the office. Dr. Slocumb was named vice president, and **Dr. John M. Wolff**, Duluth, was elected second vice president of the group. Consultant to the organization is **Dr. N. L. Gault, Jr.**, assistant dean of the University of Minnesota Medical School. **Dr. H. E. Drill**, Hopkins, is a member of the board of directors. Named to the medical and scientific board was **Dr. William Proffitt**, Minneapolis.

* * *

Dr. Catharine Corson West, Minneapolis, was mistress of ceremonies at the annual Founder's Day banquet of Epsilon chapter, Alpha Epsilon Iota, professional medical sorority, in St. Paul on February 23. The meeting was attended by about seventy-five women physicians and associate members, wives of University of Minnesota Medical School department heads.

Three Twin Cities surgeons participated in programs of a sectional meeting of the American College of Surgeons in Milwaukee, Wisconsin, February 27 to 29. **Dr. F. John Lewis**, Minneapolis, discussed low-temperature techniques in surgery, and **Dr. Donald J. Ferguson**, Minneapolis, spoke on problems of internal hemorrhage. **Dr. N. Logan Leven**, St. Paul, presented a paper on intestinal obstruction.

* * *

Dr. James Rogers Fox, Minneapolis, spoke on "The Doctor's Family in the Community" at a meeting of board members of the Woman's Auxiliary to the Minnesota State Medical Association in St. Paul early in February. Dr. Fox is radio and television director for the association.

* * *

The thirteenth annual session of the Central Surgical Association was held at Rochester February 23 to 25, with **Dr. Edward S. Judd, Jr.**, Rochester, as chairman of the local committee on arrangements. Assisting him in operation of the meeting were **Dr. John H. Grindlay**, **Dr. Deward O. Ferris**, **Dr. B. Marden Black** and **Dr. George A. Hallenbeck**, all of Rochester.

* * *

Dr. Ancel Keys, University of Minnesota physiologist, left on March 19 to accompany **Dr. Paul Dudley White**, heart consultant to the President, on a trip to Japan and Hawaii. The two, plus a team of research workers, planned to study cardiac and blood pressure differences between native Japanese and Japanese on Hawaii. They expected to spend about two weeks in each location.

* * *

The second in a series of medical information forums was held in Minneapolis on February 19 and in St. Paul on February 24. The topic for discussion at both of the public meetings was the so-called "miracle" drugs. Panel members at both meetings were **Dr. Wesley W. Spink** and **Dr. Donald W. Hastings** of the University of Minnesota. Also on the panel for the Minneapolis forum were **Dr. O. L. N. Nelson** and **Dr. Ephraim Cohen.** On the panel for the St. Paul meeting were **Dr. Herman Wolff** and **Dr. Ben Sommers.** The Minnesota Medical Foundation was the principal sponsor for the health forums. Co-sponsors were the county medical societies, city health departments and metropolitan newspapers.

* * *

Two emeritus members of the Mayo Clinic staff have been named to the international executive council of the International College of Surgeons. They are **Dr. Henry W. Meyerding,** who was elected vice chairman of the council, and **Dr. William C. MacCarty,** both of Rochester.

* * *

Dr. S. Marx White, Minneapolis, was the subject of a lengthy biographical feature article in the *Minneapolis Sunday Tribune* on February 26. The article described some of the many and varied activities carried out by Dr. White in both medical and community life. One of the early leaders in the development of the University of Minnesota Medical School, Dr. White has been professor emeritus at the school since 1942. He was one of the founders of the Nicollet Clinic in Minneapolis in 1921. He served on the Glen Lake Sanatorium commission for thirty-one years. He has received numerous awards for his community service. Now aged eighty-two, Dr. White was convalescing from an eye operation at the time the newspaper article appeared.

* * *

President-elect of the Hennepin County Medical Society is **Dr. Herman E. Drill,** Minneapolis, whose election was announced at a meeting of the society on February 6. He will succeed **Dr. Robert Priest** on October 1. Other officers elected include **Dr. Karl E. Sandt,** first vice president; **Dr. Wellington W. Rieke,** second vice president, and **Dr. Conrad J. Holmberg,** re-elected secretary-treasurer.

NEW LOCATIONS

Dr. A. J. Floersch, after practicing at Glencoe for the past two years, has become associated in practice with **Dr. John A. McIntyre** in Owatonna.

* * *

Dr. Samuel L. Hamilton, who recently completed postgraduate work in surgery and urology at the University of Illinois Research and Educational Hospital, Chicago, has become a member of the staff of the Interstate Clinic at Red Wing.

* * *

Dr. John J. Heimark, after completing a three-year fellowship in medicine at the Mayo Clinic, has joined the department of internal medicine of the Mankato Clinic, Mankato.

* * *

Dr. Paul Fraser, who recently finished a year of postgraduate training at St. Joseph Hospital, Pontiac, Michigan, has become a member of the Mork Clinic at Anoka.

* * *

Dr. Thomas W. Milroy, formerly of Winnipeg, Canada, has become associated with the Lenont-Peterson Clinic at Virginia, where he is specializing in obstetrics and gynecology.

* * *

Dr. William H. Rock, who formerly practiced in North Minneapolis, has become associated in practice with **Dr. R. H. Larson** in Anoka.

MINNESOTA BLUE SHIELD-BLUE CROSS

At a meeting of the Board of Directors on February 29, 1956, the Board decided to open Blue Shield enrollment to doctors for either Plan A or Plan B group contract. Prior to this time, in view of the courtesy care of a physician and his family by another doctor, offering Blue Shield contracts to doctors was considered unnecessary.

Within recent months an increasing number of Minnesota doctors have applied for Blue Shield contracts, and it has been found that many doctors consider Blue Shield coverage a method of solving some of the embarrassments arising in the courtesy care of one physician by another. It also has been learned that many other Blue Shield plans offer their contracts to doctors.

Several types of physician enrollment in groups are possible. These include group enrollment in clinic or doctor's office personnel groups, hospital staff groups, and in case no such groups are available, a general medical profession group into which individual applications of physicians will be funnelled.

A doctor who wishes to obtain a Blue Shield contract can secure one in any of the first three groups mentioned if such groups exist in his locality. If such group enrollment is not open to him, he can obtain an application blank by writing to Blue Cross-Blue Shield, 2610 University Avenue, Saint Paul 14, Minnesota.

During January, 1956, 86,829.5 days of hospital care were provided for 14,526 Blue Cross subscribers. Since 1933, approximately 11,600,000 days of hospital care have been provided for over 2,000,000 subscribers.

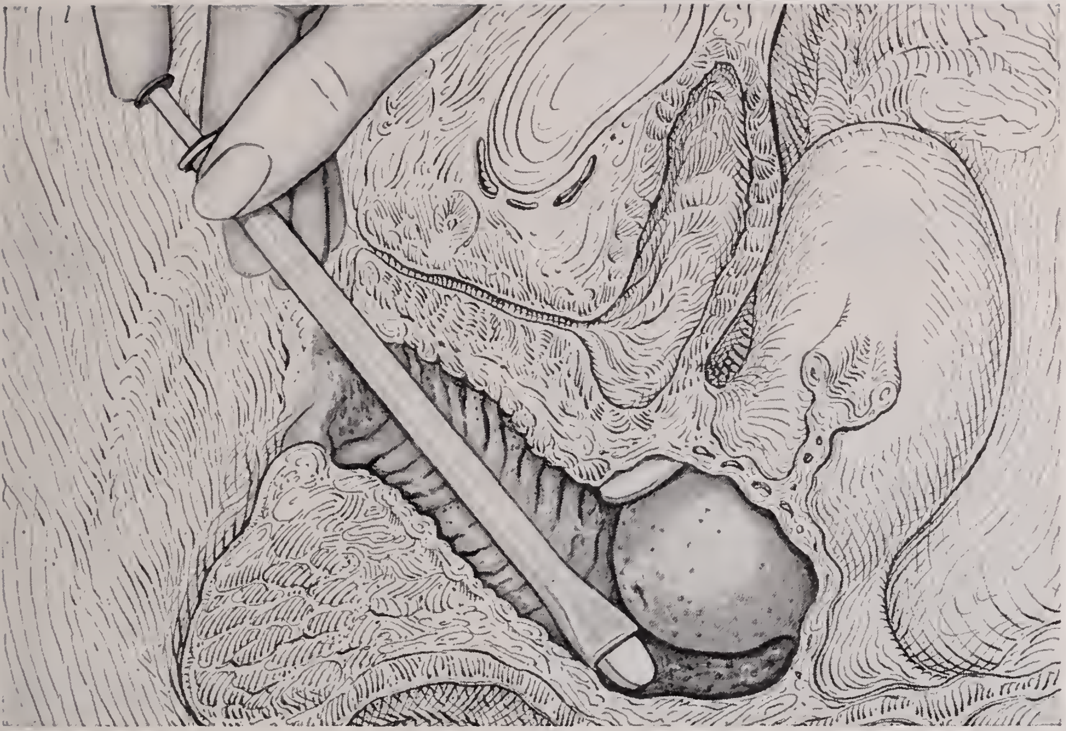
In comparing the first month of 1956 with the same period of the preceding year, it is noted that although the average length of stay remained at 6.0 days, the number of persons hospitalized increased 45 cases per year per 1,000 contracts protected.

The total number of Minnesotans protected by Blue Cross as of January 31, 1956, is 1,030,263 an increase of 3,295 persons since December 31, 1955.

Since the announcement of the availability of the new Blue Cross Optional Series Contracts in January of 1956, several outstate enrollment promotions have been completed. Initial announcement was made and a promotional campaign carried out in the St. Cloud area, January 9 to 16. The second outstate promotion announcing the availability of the Optional Series Contracts was carried out in the Madison, Minnesota area. Following in their respective order were: Brainerd, New Ulm and Faribault.

Similar promotions will be conducted in approximately 14 other outstate areas throughout 1956 in co-operation with the Hospital Administrator, medical staff and civic officials of the particular city or town.

FLORAQUIN® VAGINITIS REGIMEN



New Intravaginal Applicator for Improved Treatment of Vaginitis

The restorative treatment of vaginitis with Floraquin is now further improved by a new aid to tablet insertion. Faulty insertion is no longer a failure factor in therapy.

The new Floraquin applicator is designed for simplified insertion of Floraquin tablets by the patient. This plunger device, made of smooth unbreakable plastic, places the Floraquin tablets in the fornices and thus assures coating of the entire vaginal mucosa as the tablets disintegrate. The patient inserts two Floraquin tablets with the applicator in the morning and also two tablets at night, with treatment being continued through at least two menstrual periods. During menstruation it is desirable to increase medication to eight tablets daily to combat the alkalinity of the menstrual flow.

Warm acid douches (2 ounces of 5 per cent acetic acid or white vinegar to 2 quarts of warm water) may be taken as often as desired for hygienic purposes.

Floraquin contains Diodoquin® (diiodohydroxyquinoline, U.S.P.), the safe and effective protozoacide and fungicide. Lactose, anhydrous dextrose and boric acid are included to help restore the normal acid pH of the vaginal secretions. Such an acid vaginal medium then encourages the growth of normal flora and makes the environment unfavorable for pathogens.

A Floraquin applicator is supplied with each box of 50 (a new package size) Floraquin tablets. G. D. Searle & Co., Research in the Service of Medicine.

New Floraquin Applicator and commercial package of 50 Floraquin tablets available on request to . . . **SEARLE** P. O. Box 5110, B
Chicago 80, Illinois

a potent germicide

FOR COLD STERILIZATION

Pheneen® 'Ulmer'

SOLUTION
PHENEEN
Germicide and Fungicide
ULMER PHARMACAL COMPANY

ELIMINATES DOUBTFUL STERILITY IN OFFICE USE . . .

Rapid germicidal activity plus specific sporacidal properties enable Pheneen to provide the extra margin of safety during minor office surgery. Instruments may be stored for months in Pheneen without weekly changes of solution. Special "built-in" rust inhibitant makes this possible. Routine use of colorless, odorless Pheneen reduces questionable sterility to a minimum.

MM-456

Physicians & Hospitals Supply Co.
1400 Harmon Place Minneapolis 3, Minn.

Book Reviews

Books listed here become the property of the Ramsey, Hennepin and St. Louis County Medical Libraries when reviewed. Members, however, are urged to write reviews of any or every recent book which may be of interest to physicians.

A COURSE IN PRACTICAL THERAPEUTICS- Third Edition. Martin Emil Rehfuss, M.D., F.A.C. LL.D.(Hon.). Professor of Clinical Medicin Emeritus, and Director of Division of Therapeutic Department of Medicine, Jefferson Medical Colleg Philadelphia; Attending Physician, Jefferson Medic College Hospital, Philadelphia; and Alison Ho Price, A.B., M.D., Associate Professor of Medicin Jefferson Medical College, Philadelphia; Assistant Ph sician to Jefferson Medical College Hospital, Philade phia; Chief Clinical Assistant, Diabetic Clinic, Cur Clinic, Philadelphia. 972 pages. Illus. Price $15.0 cloth. Baltimore: Williams & Wilkins Co., 1956.

YOUR BLOOD PRESSURE AND HOW TO LI WITH IT. William A. Brams, M.D. 160 pages. Illu Price $2.95, cloth. Philadelphia: J. B. Lippincott Co 1956.

NERVOUSNESS, INDIGESTION AND PAIN; Popula Edition. By Walter C. Alvarez, M.D. 235 pages. Ne York: Harper, 1954. Price $3.50.

Although no word such as *psychosomatic* that migh be outside the average layman's vocabulary appears i this edition, Dr. Alvarez stresses the effect of the em tions on the physical organs and their functioning. H quotes Maudsley's "The sorrow which has no vent i tears may make other organs weep," as well as man passages from Austen F. Riggs.

The content deals chiefly with differential diagnoses particularly techniques of distinguishing functional fro organic illnesses, the number of the former greatly exceeding that of the latter, especially in women patients he apparently feels that neuroses are limited to the fe male of the species. Because the mental origin of complaints is so often not recognized, many needless operations are undergone by patients who afterwards find thei symptoms unalleviated. Dr. Alvarez himself calls this a "different" kind of book, which "deals more with sick unhappy persons than with their diseases, more with symptoms and their meaning than with disease entities. . ."

Even to the point of being repetitious, he emphasizes the importance of the personal conference, in which the doctor becomes personally acquainted with the patient and gets the history of his illness directly from the patient himself. So important and enlightening is the history he says, that physicians would do well to trust the diagnosis made on the basis of the history in preference to a conflicting diagnosis arrived at from laboratory or x-ray reports. It naturally follows that if the conference is to result in a diagnosis, the physician is going to have to give the patient more time than is usually customary and he will have to be more attentive to and sincerely interested in the patient as a person. From this conference the physician should be able to "size up the patient," that is, to determine the degree of sensitivity of the patient—the sensitiveness of his digestive tract and of the involuntary nerves, the sensitiveness of the patient to ıin, his suggestibility to emotion, his intelligence and ill power, and even his sanity. In fact, he says the av- age internist would be surprised to know how many ildly insane persons go through his office each month. ?hysicians can detect these psychoses and neuroses by ıch little clues as the patient's exaggerated sensitivity light, his feeling that he is discriminated against, neg- cted, and unloved, the number of jobs he has held the past five years, the inability of the patient to sit ill . . ." Even careless grooming in a patient who has rmerly been meticulous in his appearance can suggest personality change or even an actual brain lesion.

The charge of repetitiousness might be applied to his anner of expression but not to his copious illustrative ses drawn from his own experience, each of which ives home a point. By means of these illustrations he es to "Keep young physicians from forgetting that ere is such an organ as brain, that it has many dis- ses all its own, and that the symptoms of some of ese appear first in the abdomen." Throughout the book pears his central thought expressed in such words as . . no sign of disease was found when the abdomen ıs explored, I suspect . . . the disease that caused the scomfort is up in the brain, from whence the distress projected out to the periphery . . ." and "Abdominal stress is a common initial symptom of neuroses, psy- oses, and other diseases of the brain."

Since most of the neuroses and psychoses are too mild r the patient to be sent to a psychiatrist, since there a dearth of well qualified psychiatrists anyway, and ıce the average patient cannot afford to pay for the any hours needed for psychiatric treatment, Dr. Alvarez lieves that the internist should have enough training the principles of psychiatry or psychotherapy to make ch referral unnecessary. He believes that an understand- g physician, without giving offense, can make clear to e patient "what can be done to change a bad environ- ent or to remove a handicap or to lessen the strain on m." Sometimes when a bad situation cannot be anged, the patient can be taught to recognize the istence of tensions and to realize that in cases where ner conflicts are unreasolvable the wiser source is to ırn to submit to the inevitable.

Though his emphasis is on the neurotic origin of the ajority of complaints and symptoms which come to a ctor's attention, he does admit that sometimes the pa- nt is suffering from organic rather than functional ness. In such cases, he states that "many symptoms thout identifiable causes are produced by little, rarely cognized strokes." B.M.

ANDBOOK OF PEDIATRICS. By Henry K. Silver, M.D., C. Henry Kempe, M.D., and Henry B. Bruyn, M.D. 548 pages. Illus. Price $3.00. Los Altos, California: Lange Medical Publications, 1955.

The many charts, tables and illustrations and the ırty-one well-organized chapters of this pocket-sized ndbook cover an amazing amount of information con- ely and in ready reference form. As a supplement to e standard pediatrics textbooks it would be useful to diatricians, general practitioners, medical students and ɔse cramming for Board examinations. It is worth the ree dollars it costs. M.C.

Perma Plaques

preserve those important medical documents—

The Board of Medical Examiners
OF THE STATE OF CALIFORNIA
This is to Certify That
Physician's and Surgeon's Certificate
The Board of Medical Examiners

Replace old fashioned glass framing with the beautiful, modern Perma Plaque mounting . . . unbreakable . . . washable . . . dustproof . . . prevents unsightly and harmful discoloration and deterioration of your degrees and photographs.

Thousands of doctors throughout the country have discovered that with all the many advantages of beauty and lifetime protection Perma Plaques actually cost no more than ordinary types of framing.

Write for more complete information and prices
MM-456

PHYSICIANS & HOSPITALS SUPPLY COMPANY
MINNEAPOLIS 3, MINNESOTA

in arthritis
and
allied disorders...

nonhormonal anti-arthritic

BUTAZOLIDIN®

(brand of phenylbutazone)

relieves pain • improves function • resolves inflammation

Employing the serum protein-polysaccharide ratio (PR) as an objective criterion of rheumatoid activity, it has again been shown that BUTAZOLIDIN "...produces more than a simple analgesic effect in rheumatoid arthritis."[1]

Clinically, the potency of BUTAZOLIDIN is reflected in the finding that 57.6 per cent of patients with rheumatoid arthritis respond to the extent of "remission" or "major improvement."[2]

Long-term study has now shown that the failure rate with BUTAZOLIDIN in rheumatoid arthritis, and particularly in rheumatoid spondylitis, is significantly lower than with hormonal therapy.[3]

(1) Payne, R. W.; Shetlar, M. R.; Farr, C. H.; Hellbaum, A. A., and Ishmael, W. K.: J. Lab. & Clin. Med. 45:331, 1955. (2) Bunim, J. J.; Williams, R. R., and Black, R. L.: J. Chron. Dis. 1:168, 1955. (3) Holbrook, W. P.: M. Clin. North America 39:405, 1955.

BUTAZOLIDIN® (brand of phenylbutazone). Red coated tablets of 100 mg.

BUTAZOLIDIN being a potent therapeutic agent, physicians unfamiliar with its use are urged to send for literature before instituting therapy.

GEIGY PHARMACEUTICALS Division of Geigy Chemical Corporation
220 Church Street, New York 13, N. Y.
In Canada: Geigy Pharmaceuticals, Montreal

Geigy

51155

A Complete Orthopedic Fitting Service

PRESCRIPTION SERVICE BY CERTIFIED FITTERS AT

HOSPITAL—OFFICE—HOME

Camp Supports,
Identical Form Breasts,
Orthopedic Shoes,
Artificial Limbs,
Arms, Braces

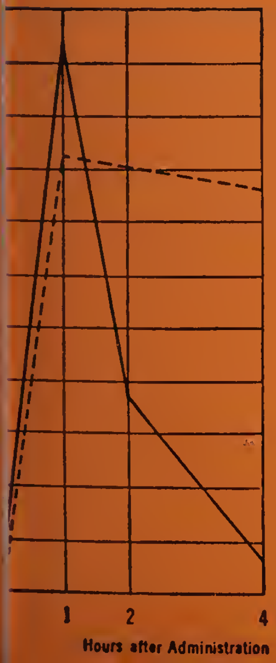
For Men, Women and Children

RAY TRAUTMAN AND SON

410 Portland
FE 2-2339
Minneapolis 15, Minn.

We will be in Booth No. 73 at Rochester.

! Palatable Oral Suspension Gives
ger, Faster Blood Levels than Twice
Dose of Injected Procaine Penicillin



This ready-mixed, stable, and pleasantly flavored suspension is supplied as follows: PEN•VEE•*Suspension*, 300,000 units per 5-cc. teaspoonful, bottles of 2 fl. oz. Also available: PEN•VEE•*Oral* Tablets, 200,000 units, scored, bottles of 36; 500,000 units, scored, bottles of 12.

PEN•VEE*•*Suspension*

Benzathine Penicillin V Oral Suspension

ORAL PENICILLIN
WITH
INJECTION PERFORMANCE

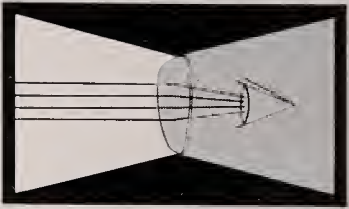
Wyeth®
Philadelphia 1, Pa.

*Trademar

BENSON'S complete prescription
service includes . . .

SOFT-LITE

The light-absorptive lens
that provides
greater eye-comfort
for your patients.



- **Soft-Lites** provide protection from over-brightness to light-sensitive eyes*. They absorb and transmit light naturally and comfortably, allowing all colors to be viewed in their natural proportions.
- **Soft-Lites** are pleasing in appearance . . . duplicating natural flesh tints . . . blending harmoniously with the complexion . . . casting no shadows under the eyes.
- **Soft-Lites** are made in all commonly used forms . . .and in shades to meet every indoor requirement.

* Aware of the "over-brightness" problem, Sylvania Electric Co. has produced the pink *Softlight* bulb for domestic use. The tremendous response to this bulb is another indication of the public's desire for more comfort in lighting and viewing.

We suggest you recommend *SOFT-LITE* to your patients and that you take advantage of BENSON'S prompt prescription service when your prescriptions call for *SOFT-LITE*.

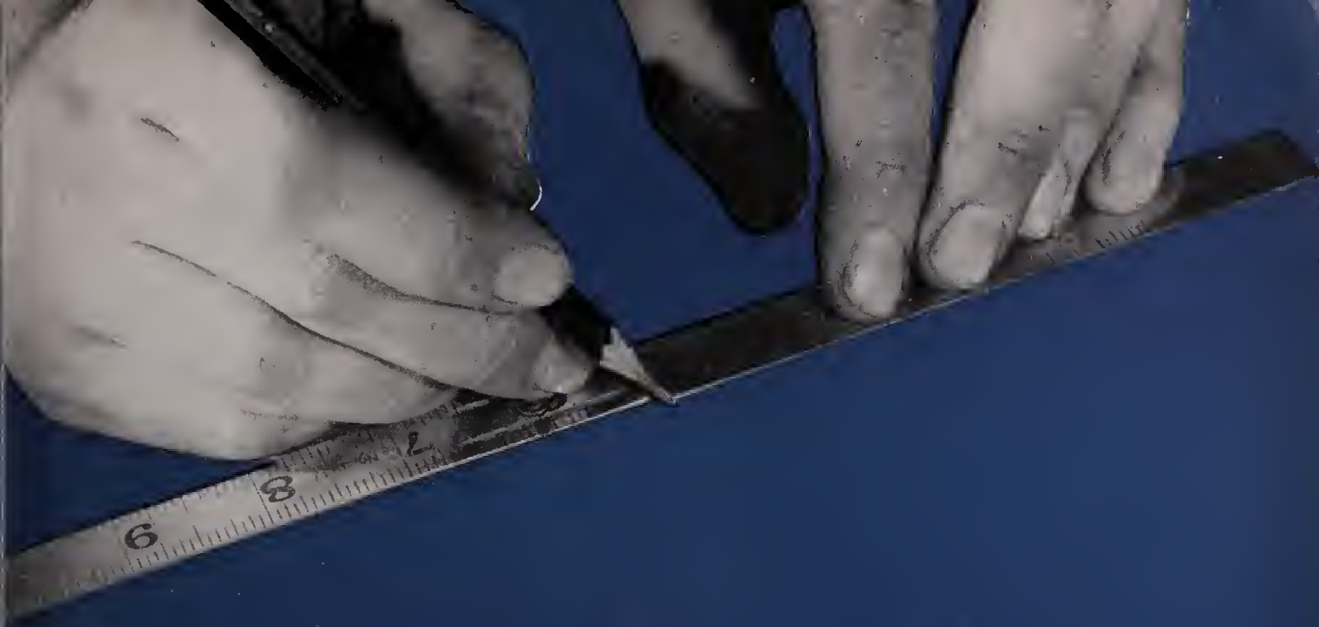
Since 1913 **Benson** OPTICAL COMPANY ***Executive Offices • Minneapolis 2, Minn.***

COMPLETE LABORATORIES CONVENIENTLY LOCATED IN UPPER MIDWEST CITIES

HOMEWOOD HOSPITAL is one of the Northwest's outstanding hospitals for the treatment of Nervous Disorders equipped with all the essentials for rendering high-grade service to patient and physician.

Operated in Connection with
Glenwood Hills Hospitals

HOMEWOOD HOSPITAL
Corner Penn and Plymouth Avenues North
Minneapolis Minnesota



Re-activate the arthritic

MOST POTENT
ANTI-RHEUMATIC

Sterane*

Even where hydrocortisone, cortisone, and other agents had failed, prednisolone (STERANE) restored articular mobility and functional capacity to normal in rheumatoid arthritis.[1]

Four times more effective than hydrocortisone, and, on the basis of preliminary findings,[2,3] superior in potency even to prednisone (cortisone analog), STERANE is also relatively free of such hormonal side effects as edema, hypertension, or hypopotassemia.

Supplied: White, 5 mg. oral tablets, in bottles of 20 and 100. Pink, 1 mg. oral tablets, in bottles of 100. Both are deep-scored and in the distinctive "easy-to-break" size and Pfizer oval shape.

References: 1. Bunim, J. J., et al.: J.A.M.A. 157:311, 1955. 2. Forsham, P. H., et al.: Paper presented at First Internat. Conf. on Prednisone and Prednisolone, New York, May 31-June 1, 1955. 3. Perlman, P. L., and Tolksdorf, S.: Scientific Exhibit presented at A.M.A. Annual Meet., Atlantic City, June 6-11, 1955.

PFIZER LABORATORIES Division, Chas. Pfizer & Co., Inc. Brooklyn 6, New York

*brand of prednisolone

for a spastic
GUT

Trasentine®-Phenobarbital

integrated relief . . .
mild sedation
visceral spasmolysis
mucosal analgesia

TABLETS *(yellow, coated), each containing 50 mg. Trasentine® hydrochloride (adiphenine hydrochloride CIBA) and 20 mg. phenobarbital.*

C I B A
Summit, N. J.

2/2226M

HELP FOR PROBLEM DRINKERS *

* The Problem Drinker is one whose drinking causes a continuing and growing problem in any department of his life.

IF YOU HAVE PATIENTS IN THIS CATEGORY . . . . INVESTIGATE!

Hazelden is a non-profit organization, designed to help problem drinkers return to normal living. Its peaceful country setting is on beautiful Lake Chisago, near Center City, 45 miles northeast of the Twin Cities, with spacious grounds, suitable and well-equipped buildings. Hazelden is secluded, yet within easy reach of U. S. Highway 8.

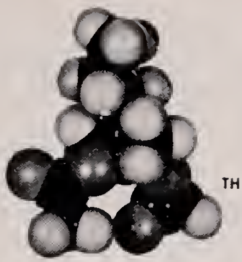
Your Inspection Is Invited.
Complete Information on Request.

Director
LYNN CARROLL

Affiliated with St. Croix Memorial Hospital
MEDICAL STAFF
Fred B. Reigel, M.D., *Chief of Staff*
J. C. Belshe, M.D., *Asst. Chief of Staff*
Norwood E. Wegner, M.D.

Hazelden
Twin Cities Office
341 North Dale Street - Saint Paul, Minn.

24 Hour Telephone—CApital 7-6397



THE MILTOWN MOLECULE

Two articles in the April 30th issue of The Journal of the AMA[1,2] report on . . .

an entirely new type of tranquilizer with muscle relaxant action—orally effective in

ANXIETY, TENSION and MENTAL STRESS

- no autonomic side effects—well tolerated
- selectively affects the thalamus
- not related to reserpine or other tranquilizers
- not habit forming, effective within 30 minutes for a period of 6 hours
- supplied in 400 mg. tablets. Usual dose: 1 or 2 tablets—3 times a day

1. Selling, L. S.: J.A.M.A. **157:** 1594, 1955. **2.** Borrus, J. C.: J.A.M.A. **157:** 1596, 1955.

Miltown®

the original meprobamate—2-methyl-2-n-propyl-1,3-propanediol dicarbamate—U. S. Patent **2,724,720**

DISCOVERED AND INTRODUCED by Wallace Laboratories, New Brunswick, N. J.

Literature and Samples Available On Request

Relax the best way
... pause for Coke
continuous quality
is quality you trust
DRINK
Coca-Cola
Work
Refreshed
DRINK
Coca-Cola
REG. U.S. PAT. OFF.

A MODERN
PRIVATE
SANITARIUM

for the
Diagnosis, Care
and Treatment
of Nervous
and Mental
Disorders

MAIN BUILDING—One of 10 Units in "Cottage Plan"

ST. CROIXDALE ON LAKE ST. CROIX

PRESCOTT, WISCONSIN

Located on beautiful Lake St. Croix, 18 miles from the Twin Cities, it has the advantages of both City and Country. Every facility for treatment provided, including recreational activities and occupational-therapy under trained personnel. Close personal supervision given patients, and modern methods of therapy employed. Inspection and cooperation by reputable physicians invited. Rates very reasonable. Illustrated folder on request.

Prescott Office
Prescott, Wisconsin
Howard J. Laney, M.D.
Tel. 39 and Res., 76

Consulting Neuro-Psychiatrists
Hewitt B. Hannah, M.D., Andrew J. Leemhuis, M.D.
527 Medical Arts Bldg., Tel. FE. 2-1357, Minneapolis, Minn.

Superintendent
Ella M. Leseman
Prescott, Wisconsin
Tel. 69

All the benefits of prednisone and prednisolone plus positive antacid action to minimize gastric distress

Multiple Compressed Tablets of 'Co-Deltra' and 'Co-Hydeltra' are designed to help the physician cope with the problem of gastric distress which might otherwise become an obstacle to therapy with the newer steroids prednisone and prednisolone. Each Multiple Compressed Tablet is specifically formulated as a "tablet within a tablet" to provide stability and to release in sequence antacid and anti-inflammatory components.

NEW

'Co-Hydeltra'

Prednisolone Buffered

and

'Co-Deltra'

Prednisone Buffered

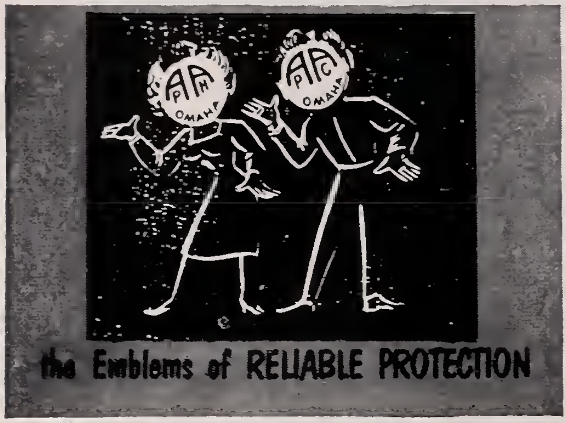
MULTIPLE COMPRESSED TABLETS

Supplied: Multiple Compressed Tablets of 'Co-Deltra' and 'Co-Hydeltra', each containing 5 mg. prednisone or prednisolone, 300 mg. of dried aluminum hydroxide gel, U.S.P., and 50 mg. of magnesium trisilicate, U.S.P., bottles of 30 tablets.

'Co-Deltra' and 'Co-Hydeltra' are the trademarks of Merck & Co., Inc.

SHARP & DOHME
Philadelphia 1, Pa.
Division of Merck & Co., Inc.

WE CORDIALLY INVITE YOUR INQUIRY for application for membership which affords protection against loss of income from accident and sickness (accidental death, too) as well as benefits for hospital expenses for you and all your eligible dependents.


APH
OMAHA
APC
OMAHA
the Emblems of RELIABLE PROTECTION

SINCE
1902

ALL PREMIUMS COME FROM

PHYSICIANS
SURGEONS
DENTISTS

ALL BENEFITS GO TO

$4,500,000 ASSETS
$22,500,000 PAID FOR BENEFITS

PHYSICIANS CASUALTY
AND
HEALTH ASSOCIATIONS
OMAHA 2, NEBRASKA

"The substitution of oral Neohydrin for parenteral meralluride was successfully accomplished in 97 per cent of 70 ambulatory clinic out-patients with chronic congestive heart failure."*

*Lawrence, W. E.; Kahn, S. S., and Riser, A. B.: South. M. J. 47:105, 1954.

00656

NEW!
Patented HANSEN
Split Frame Truss

Positive Hernia Control
Contoured Spring Design Gives
Custom Made Comfort
Unlimited Body Activity
Single with Dummy Illustrated
Double not Illustrated

C. F. ANDERSON CO., INC.

901 Marquette
Minneapolis, Minnesota

specify

Lederle

POLIOMYELITIS
IMMUNE GLOBULIN
(human)

For the modification of measles and the prevention or attenuation of infectious hepatitis and poliomyelitis.

LEDERLE LABORATORIES DIVISION
AMERICAN Cyanamid COMPANY
PEARL RIVER, NEW YORK

Cook County Graduate School of Medicine

INTENSIVE POSTGRADUATE COURSES
STARTING DATES—SPRING-SUMMER, 1956

- SURGERY—Surgical Technic, two weeks, April 30, May 14
  - Surgical Anatomy and Clinical Surgery, two weeks, June 18
  - Surgery of Colon and Rectum, one week, May 7, June 18
  - General Surgery, two weeks, April 23
  - Thoracic Surgery, one week, June 4
  - Esophageal Surgery, one week, June 11
  - Breast and Thyroid Surgery, one week, June 18
  - Gallbladder Surgery, ten hours, June 25
  - Fractures and Traumatic Surgery, two weeks, June 18
  - Varicose Veins, ten hours, April 30, June 18
- GYNECOLOGY—Office and Operative Gynecology, two weeks, April 16, June 18
  - Vaginal Approach to Pelvic Surgery, one week, April 30, June 11
- OBSTETRICS—General and Surgical Obstetrics, two weeks, May 7
- MEDICINE—Internal Medicine, two weeks, May 7
  - Electrocardiography and Heart Disease, two weeks Basic Course, July 9
  - Gastroscopy and Gastroenterology, two weeks, September 10
  - Dermatology, two weeks, May 7
- RADIOLOGY—Diagnostic X-ray, two weeks, April 30, September 17
  - Clinical Uses of Radioisotopes, two weeks, May 7
- PEDIATRICS—Intensive Review Course, two weeks, May 14
  - Neurological Diseases: Cerebral Palsy, two weeks, June 18
- UROLOGY—Two-week course, October 8
  - Cystoscopy, ten days, by appointment

TEACHING FACULTY—ATTENDING
STAFF OF COOK COUNTY HOSPITAL

ADDRESS: REGISTRAR, 707 South Wood Street,
Chicago 12, Illinois

EVERY WOMAN
WHO SUFFERS
IN THE
MENOPAUSE
DESERVES
"PREMARIN"®

*widely used
natural, oral
estrogen*

AYERST LABORATORIES
New York, N.Y. • Montreal, Canada
5646

Upjohn
KALAMAZOO

Indicated
in most conditions
in which oral cortisone
or hydrocortisone is effective
• Available in 1 mg. and 2.5 mg.
tablets in bottles of 100, and in 5 mg.
tablets in bottles of 30, 100, and 500 •
Usual dosage is ½ to 1 tablet three or four
times daily

Delta-Cortef*

requires only 1/3 the dose of hydrocortisone

*Trademark for the Upjohn brand of prednisolone (delta-l-hydrocortisone)

Brown & Day, Inc.

New Improved
3 cubic foot
BIOLOGICAL REFRIGERATOR
By Dillon-Lilly
Especially Designed for Doctors

Stores biologicals and serums safely till needed. Has fingertip lock and 2 keys; 2 large ice cube trays; convenient pull-out drawer; thermostatic control; easily removed shelves. White enamel or Ebony black finish; black base with toe recess.

WRITE FOR DETAILS

"Everything for the Physician"

for fast service call CA 2-1845

SERVICE BROWN & DAY INC. SAINT PAUL U.S.A. QUALITY

62-64 EAST 5TH ST
St. Paul 1, Minn.

THE
MEDICAL PROTECTIVE COMPANY
FORT WAYNE, INDIANA

unique
in successfully fighting
malpractice charges

**PROFESSIONAL PROTECTION
EXCLUSIVELY
SINCE 1899**

MINNEAPOLIS Office:
Robert L. McFerran, Rep.,
311 East 24th St., Apt. A-1
Telephone Federal 9-1292
Donald D. Martin, Rep.,
318 E. 25th St., Apt. D-8
Telephone Federal 6-8751

New STEELINE Pediatric Table

Eases the burden of the physician's daily work

Includes built-in tare balance scale, built-in measuring rod, foam rubber cushion and electrical outlets with cord and plug—there are no accessories to buy. Top quality construction features include all-welded steel body, two roomy drawers and a large open compartment with shelf, providing easy, unhampered access to instruments and supplies. Front edge is protected from wear by a stainless steel baffle plate. Despite the fact that this new table has been designed to provide the physician with the best modern equipment, efficient modern production methods in our own factory permit us to keep the price well below that of comparable models. Write today for complete information.

a. s. aloe company OF MINNESOTA
927 Portland Avenue, Minneapolis 4, Minn. • Phone:

DISABILITY INSURANCE

NON-CANCELLABLE
GUARANTEED RENEWABLE
to age 65

MAJOR MEDICAL (Catastrophe)

•

LONG TERM DISABILITY INCOME
15 year sickness
Lifetime accident

•

DISABILITY INCOME
combined with Life Insurance
$20 per month per $1000 face value

MONARCH Life Insurance Company

Leslie V. Randall, Jr.
1045 Northwestern Bank Bldg.
6th and Marquette
Minneapolis 2, Minnesota

Bernard J. Cashman
682 Endicott-on-Robert
St. Paul 1,
Minnesota

"Neohydrin... offers the striking advantage of a high degree of therapeutic effectiveness upon oral administration."*

*Krantz, J. C., Jr., and Carr, C. J.: The Pharmacologic Principles of Medical Practice, ed. 3, Baltimore, The Williams and Wilkins Company, 1954, p. 998.

98556

Classified Advertising

Replies to advertisements with key numbers should be mailed in care of Minnesota Medicine, *2642 University Avenue, Saint Paul 14, Minnesota.*

AVAILABLE August 1, young general practitioner for locum tenens or temporary association. Write E-519, care Minnesota Medicine.

WANTED—Locum tenens in General Practice, for about three months beginning July 1. Address E-524, care Minnesota Medicine.

WANTED—Young General Practitioner, also young Internist to join small group consisting of Pediatrician, General Practitioner and General Surgeon in Minneapolis. Building is entirely new and designed for group practice. Address E-504, care Minnesota Medicine.

WANTED—General practitioner for State Hospital. Salary range $641 to $781 per month. Quarters available, subsistence, laundry, and garage. Government working conditions, paid holidays, vacation, sick leave, and retirement pension plan. Write Superintendent, Fergus Falls State Hospital, Fergus Falls, Minnesota.

PHYSICIAN WANTED—In Southern Minnesota town. Address Grand Meadow Health Association, Grand Meadow, Minnesota.

WANTED—Associate in general practice. Excellent office, housing, schools, and hospital facilities. Early partnership. Twenty-five miles northwest of Minneapolis. R. D. Thielen, M.D., St. Michael, Minnesota.

PHYSICIAN NEEDED—In county seat town of 1800, located in excellent farming community, Central Minnesota. No other physician within 35-mile radius. New 25-bed hospital planned. Good schools and housing. Office available. Address Kenneth Mattson, Mahnomen, Minnesota.

WANTED—Assistant or associate in general practice, by two associated general practitioners in prosperous central Minnesota town. New hospital and excellent facilities. Prefer associate with some special training or experience. Please state qualifications and ambitions in application. Write E-522, care of Minnesota Medicine.

WANTED—Assistant in General Practice in Central Minnesota. Prosperous community—good hunting and fishing. New 32-bed hospital. Address E-514, care Minnesota Medicine.

WANTED—General practitioner to replace present doctor leaving to specialize. Unopposed practice with excellent immediate income. Address E-518, care Minnesota Medicine.

WANTED—Board-certified or board-elegible ophthalmologist. Group of thirteen doctors in small midwest community. Liberal starting salary and partnership after one year. Address E-525, care Minnesota Medicine.

LOCUM TENENS—Physician's services required until July, 1957, Northwestern Minnesota. Lucrative general and surgical practice. Equipped office near community hospital available on rental basis. Immediate income. Possible purchase later. Address E-527, care Minnesota Medicine.

MODERN MEDICAL CLINIC, in Upper Peninsula of Michigan, is seeking services of Ophthalmologist or Ophthalmologist-Otolaryngologist or Doctor of Medicine capable of prescribing eyeglasses. Optician and modern eye shop associated in this clinic. Address E-520, care Minnesota Medicine.

WANTED—Residents in Psychiatry. Opportunity for beginning and advanced candidates in five-year Minnesota State Program offered in collaboration with University of Minnesota and Mayo Foundation. Must be acceptable to above training centers. Stipends $5,000 to $7,000. Direct reply to Dale C. Cameron, M.D., Medical Director, Minnesota State Department Welfare, 117 University Avenue, Saint Paul 1, Minnesota, giving full information about training and experience.

WANTED—Superintendent-Manager, District Tuberculosis Sanatorium, Southwestern Minnesota. Agricultural town 8000. Modern residence. Requires training in tuberculosis control and preventive medicine, supervision District Tuberculosis control program. Salary open. Address E-517, care Minnesota Medicine.

PSYCHIATRIC NURSING INSTRUCTOR. B.S. degree required. $3,300 yearly salary; furnished apartment, meals and laundry, 40-hour, 5-day week, paid vacation, 7 holidays and liberal sick leave. Apply Personnel Office, Mental Health Institute, Independence, Iowa.

WANTED—Position in medical office or clinic as medical secretary, bookkeeper and receptionist; able to do x-ray work, EKGs, BMRs and some laboratory procedures. Five years' experience. Address E-526, care Minnesota Medicine.

DOCTOR OR DENTIST—Beautiful suite in South Minneapolis. Very modern. Six months free rent. Then option of lease at very reasonable rent. Wm. L. Cochrane, 4101 - 42nd Avenue South, Minneapolis, Minnesota. Telephone Ro 9-8758.

FOR RENT—Four connecting rooms with private hall and large waiting room shared by successful M.D.—$50 per month. Building has elevator, faces main street; occupied by only professional men for past thirty years. Apply to E. J. Webber Company, Fergus Falls, Minnesota.

FOR RENT—Office space in new AOUW Building, 2706 W. Seventh Boulevard at Edgecumbe Road, adjacent to new Remington Rand Building. Rooms aid conditioned, sound proof. Large housing development in progress. Excellent location for physician or dentist. Street entrance. Unlimited parking facilities. Call or write Dr. Berenice Moriarty at above address. Telephone MIdway 9-6681.

FOR RENT—Medical Building in Hillcrest Shopping Center now completed. Two-thirds of Medical Offices occupied. Three suites still available. Building modernly equipped with convenient facilities, air-conditioning, ample parking and centrally located in Northwest's faster growing Center. Adjacent to Snyder's Drug Store filling over 200 prescriptions per day. Approximately 75,000 residents serviced by Hillcrest Center. Call or write Hillcrest Development, 1457 University Avenue, Saint Paul 4, Minnesota. MI. 5-5829.

ATTENTION DENTISTS AND DOCTORS—Modern space available for dentists' and doctors' offices. A location where several sets of doctors and dentists have been long established and then built their own clinics. A money maker. Above Kisch's Food Market. Plenty of auto parking space. Apply 637 Stryker Avenue, Saint Paul, Minnesota.

FOR RENT OR SALE—Eight-room, first-floor physician's office. Well equipped. Near Twin Cities. Gross over $30,000. New hospital—unlimited privileges. Good opportunity. Write E-511, care MINNESOTA MEDICINE.

FOR RENT—Highland Shopping Area, equipped office available, full or part time. Share with surgeon and dentist. Excellent for general practice, obstetrics, pediatrics. No equipment necessary; no rent until established. H. Schwyzer, M.D., 2069 Ford Parkway, Saint Paul. Telephone: MI 8-4832 or CA 4-7416.

FOR SALE—General practice established thirty-three years, excellent hospital facilities near by. Reason retiring. T. A. Clifton, M.D., Chatfield, Minnesota.

FOR SALE—Steel hospital bed. Nearly new, very good condition. Head and knee action. Mattress optional. $50.00. Paul C. Kellogue, 3407 Cedar Avenue, Minneapolis 7, Minnesota. Telephone PA. 2-3715.

FOR SALE—Doctor's office furniture and equipment. Good condition very reasonable. Retiring. For particulars, address E-523, care MINNESOTA MEDICINE.

SKILL AND CARE!

Combine with quality materials in all Buchstein-Medcalf orthopedic appliances. Our workmanship and scientific design conform to the most exacting professional specifications. Accepted and appreciated by physicians and their patients for more than 45 years.

ARTIFICIAL LIMBS, TRUSSES,
ORTHOPEDIC APPLIANCES,
SUPPORTERS, ELASTIC HOSIERY

Prompt, painstaking service

Buchstein-Medcalf Co.
223 So. 6th St. Minneapolis 2, Minn.

GLYCAMINE®
TABLETS

For Peptic Ulcers and Hyperacidity

Available All Drug Stores

Distributed by
DALCO PHARMACAL CO.
Minneapolis, Minnesota

GYNECOLOGIC CYTOLOGY SERVICE
Interpretation of Cervico-Vaginal, Etc.
(Papanicolaou) Smears
for the
Diagnosis of Carcinoma
Kits (Slides, Spatulas, Fixative and Mailing Containers)
and
Instructions for Taking and Mailing Smears furnished on request

M. WM. RUBENSTEIN, M.D.
GYNE-CYTOLOGY LABORATORY
104 S. MICHIGAN AVE. CHICAGO 3, ILL.

RADIUM RENTAL SERVICE
4340 CEDARWOOD ROAD
MINNEAPOLIS 5, MINNESOTA
TEL. FE 3-5297

Radium element prepared in type of applicator requested

ORDER BY TELEPHONE OR MAIL
PRICES ON REQUEST

UNUSUAL LENS GRINDING

CATARACT,
MYO-THIN
and other difficult and complicated lenses are ground to extreme thinness and accuracy by our expert workmen.

ARTHUR F. WILLIAMS

SAINT PAUL
MINNESOTA

THE BANK
WHERE YOU
FEEL AT
HOME

the AMERICAN
NATIONAL BANK OF SAINT PAUL
MEMBER FEDERAL DEPOSIT INSURANCE CORPORATION

ATTEND THE

103rd Annual Meeting
MINNESOTA STATE MEDICAL ASSOCIATION

Rochester, Minnesota

May 21-23, 1956

Detailed program starts on page 247

DANIELSON MEDICAL ARTS PHARMACY, INC.

10-14 Arcade, Medical Arts Building
825 Nicollet Avenue—Two Entrances—78 South Ninth Street
MINNEAPOLIS

PHONES:
FEderal 3-3317
FEderal 3-3318

HOURS:
WEEK DAYS—8 to 7
SUN. & HOL.—10 to 1

Insurance at a Saving

Druggists' Mutual Insurance Company
OF IOWA, ALGONA, IOWA

Prompt Loss Service

Fire - Tornado - Automobile Insurance

MINNESOTA REPRESENTATIVE—S. E. STRUBLE, WYOMING, MINN.

The Birches Sanitarium, Inc.

2391 Woodland Avenue
Duluth 3, Minnesota

A hospital for the care and treatment of Nervous and Mental disorders. Quiet, cheerful environment. Specially trained personnel. Recreational and occupational therapy.

Dr. L. R. Gowan, M.D., M.S., Medical Director

Index to Advertisers

Aloe, A. S., Co. A-51
American Cancer Society A-56
American National Bank A-54
Ames Co., Inc. Cover III
Anderson, C. F., Co., Inc. A-48
Arthur Hotel A-9
Ayerst Laboratories A-49

Baker Laboratories, Inc. A-16
Benson Optical Co. A-42
Birches Sanitarium, Inc. A-55
Brown & Day, Inc. A-50
Buchstein-Medcalf Co. A-53
Burroughs Wellcome & Co. A-22

Carlton Hotel A-9
Caswell-Ross Agency 218-A
Ciba A-44
Classified Advertising A-52, A-53
Coca-Cola A-46
Cook County Graduate School of Medicine A-49
Corn Products Refining Co. A-24

Dalco Pharmacal Co. A-32, A-53
Danielson Medical Arts Pharmacy, Inc. A-54
Druggists Mutual Insurance Co. A-54

Geigy Pharmaceuticals A-40
Globe, Inc. A-34
Green Parrot Cafe A-7
Gyne-Cytology Laboratory A-53

Hazelden Foundation A-44
Hoffmann-La Roche Facing A-20
Hollands Cafeteria A-12
Homewood Hospital A-42
Hotel Martin A-9

Juran & Moody, Inc. A-30

Kahler Corporation A-11
Knox, Chas. B., Gelatine Co., Inc. A-27

Lakeside Laboratories (Neohydrin) A-25, A-48, A-51
Lederle Laboratories 218-B, 218-C, A-49
Lilly, Eli, & Co. Cover I, A-36
Lucille's Chocolate Shop A-12

Mead Johnson & Co. Cover IV
Medical Protective Co. A-50
Medtronic A-14
Michaels Restaurant A-10
Monarch Life Insurance Co. A-51

Parke, Davis & Co. Cover II, A-1
Pfizer Laboratories, Div. of Chas. Pfizer
  & Co., Inc. A-33, A-43
Physicians Casualty & Health Associations A-48
Physicians & Hospitals Supply Co. A-38, A-39
Pine Cheese Mart A-7

Radium Rental Service A-53
Riker Laboratories A-19
Rochester Dairy A-12
Rochester Retail Merchants Association A-13

St. Croixdale Sanitarium A-46
St. Paul Fire & Marine Insurance Co. A-14
Schering Corporation Facing A-16, A-23
Searle, G. D., & Co. A-37
Sharp & Dohme A-21, A-28, A-29, A-35, A-47
Smith, Kline & French Laboratories A-15
Squibb A-18
Sutliff & Case Co., Inc. A-14

Texal Company A-20
Town House Barestaurant A-10
Trautman Artificial Limb Co. A-41

Upjohn A-31, A-50

Viceroy Cigarettes A-26

Wallace Laboratories A-45
Waters Corporation, The A-6
Weber & Judd Co. A-8
Williams, Arthur F. A-54
Winthrop Laboratories 218-D
Woodhouse Brothers A-6
Wyeth A-17, A-41

Yellow Cab A-12

The Bells Are Ringing

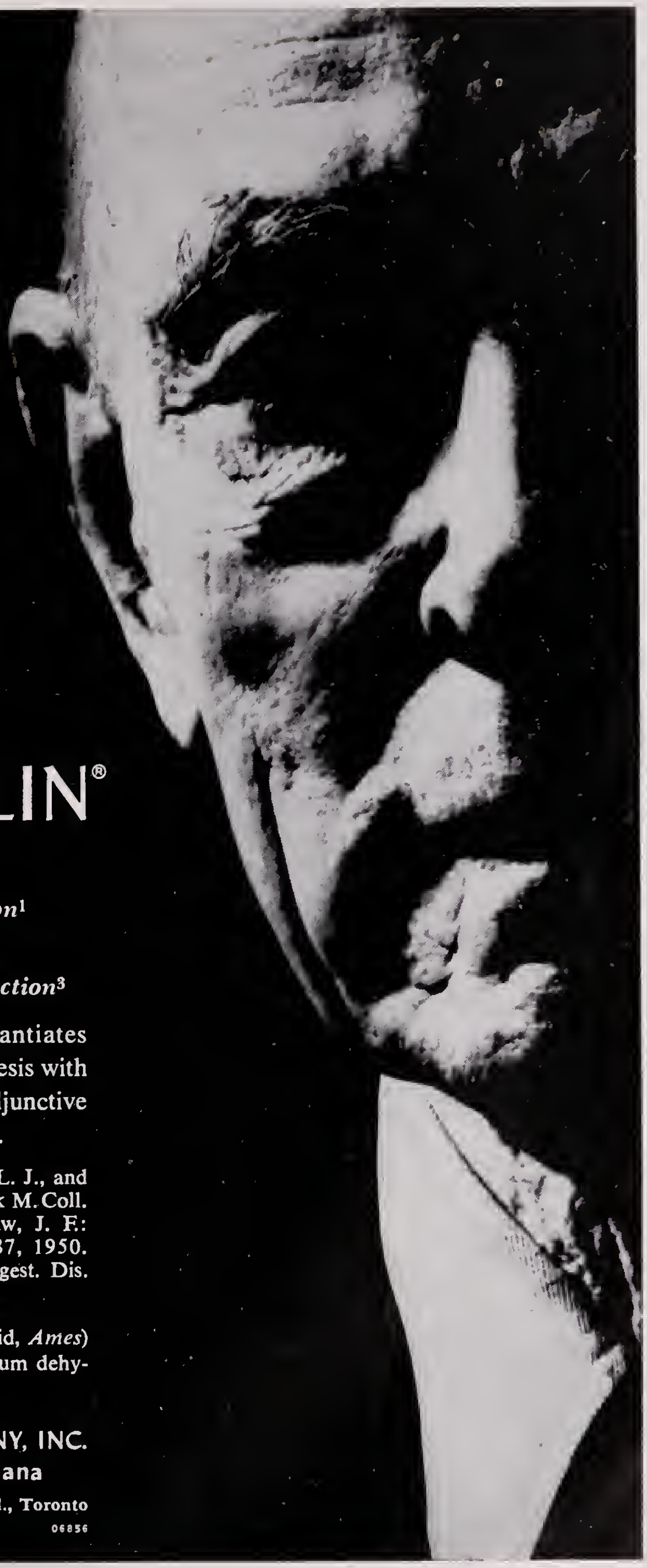
In cities, towns and villages all over America, the ringing of church bells one day in April will mark the launching of the annual Cancer Crusade of the American Cancer Society. At the same time, in many doctors' offices, the staccato ring of door and telephone bells will mark the success of a major objective of the Society.

"Fight Cancer with a Checkup" is the American Cancer Society's immediate, short-range answer to the terrible toll of lives taken each year by this dread disease. It is to your office that the Society is urging the public to go for the periodic examinations that can mean the early detection and prompt treatment of cancer, and could prevent thousands and thousands of needless deaths.

Achievement of our ultimate goal — the conquest of cancer — will be largely determined by the response to our plea to "Fight Cancer with a Check". This year the Society needs $26,000,000 to carry on its vital program of education, research and service.

"Fight Cancer with a Checkup and a Check"—a winning combination. With your support and the cooperation of the public, the sound of victory will one day ring through the land.

American Cancer Society ®



routine
physiologic
support
for your
aging
patients

"therapeutic bile"

DECHOLIN®

one tablet t.i.d.

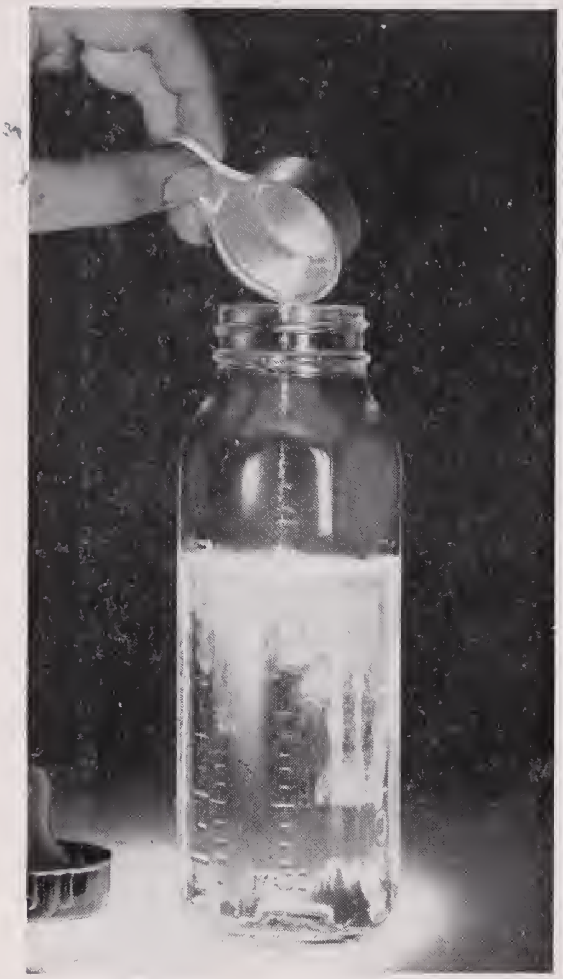
to improve liver function[1]
to produce fluid bile[2]
to restore intestinal function[3]

Clinical evidence substantiates the value of *hydro*choleresis with *Decholin* as routine adjunctive therapy in older patients.

(1) Schwimmer, D.; Boyd, L. J., and Rubin, S. H.: Bull. New York M. Coll. *16*:102, 1953. (2) Crenshaw, J. F.: Am. J. Digest. Dis. *17*:387, 1950. (3) King, J. C.: Am. J. Digest. Dis. *22*:102, 1955.

Decholin (dehydrocholic acid, *Ames*) and *Decholin Sodium* (sodium dehydrocholate, *Ames*).

AMES COMPANY, INC.
Elkhart, Indiana
Ames Company of Canada, Ltd., Toronto
06856



New...improved...

"instant"

Olac®

Powdered high protein formula

is easier to use

New, improved Olac dissolves instantly with water...makes a smooth, good-tasting formula with the briefest shaking or stirring.

...provides satisfying, growth-promoting feedings for

- full term bottle-fed babies
- prematures
- supplementary feedings of breast-fed babies

Olac's milk protein content is exceptionally generous. Its fat is a single highly refined vegetable oil. Curd tension is now reduced practically to zero.

Mead products and services are designed to help you in the varied phases of infant feeding

MEAD SYMBOL OF SERVICE IN MEDICINE

MEAD JOHNSON & COMPANY, EVANSVILLE 21, INDIANA, U.S.A.

MSMA Annual Meeting—Rochester, May 21-23, 1956

Minnesota MEDICINE

PUBLISHED MONTHLY BY THE MINNESOTA STATE MEDICAL ASSOCIATION

Volume 39 MAY, 1956 Number 5

Printed in U.S.A. (Table of Contents—Pages A-2 and A-3) 40c a copy—$3.00 a year

COLLEGE OF
LIBRARY
MAY 28 1956
OF PHILADELPHIA

Fastest and shortest-acting oral barbiturate

'Seconal Sodium'

(SECOBARBITAL SODIUM, LILLY)

Among its many uses:

- Simple insomnia
- Unruly pediatric patients
- Obstetric patients
- Procedures associated with moderate pain

In 1/2, 3/4, and 1 1/2-grain pulvules and in ampoules, suppositories, and 'Enseals' (Timed Disintegrating Tablets, Lilly); also, Elixir 'Seconal' (Secobarbital, Lilly).

Lilly

good medicine
for
sick youngsters

Suspension Chloromycetin® Palmitate

pleasant-tasting Chloromycetin for pediatric use

Your young patients won't hit the war path at medication time when the prescription calls for SUSPENSION CHLOROMYCETIN PALMITATE. Its appealing custard flavor rates it as "good medicine" with the most rebellious braves.

Good medicine, too, for a wide variety of infections in infancy and childhood, CHLOROMYCETIN (chloramphenicol, Parke-Davis) affords rapid recovery and speedy convalescence.

Because of its liquid form, dosage of SUSPENSION CHLOROMYCETIN PALMITATE is easily adjusted. That it needs no refrigeration is an additional convenience to every harassed mother.

CHLOROMYCETIN

CHLOROMYCETIN is a potent therapeutic agent and, because certain blood dyscrasias have been associated with its administration, it should not be used indiscriminately or for minor infections. Furthermore, as with certain other drugs, adequate blood studies should be made when the patient requires prolonged or intermittent therapy.

supplied: SUSPENSION CHLOROMYCETIN PALMITATE, containing the equivalent of 125 mg. of Chloromycetin in each 4 cc., is available in 60-cc. vials.

MEDICAMENTA VERA

PARKE, DAVIS & COMPANY DETROIT, MICHIGAN

Volume 39
Number 5

Minnesot

Contents f

SCIENTIFIC ARTICLES

ORIGINAL CONTRIBUTIONS

Obstruction of the Alimentary Tract in the Neonatal Period
George A. Hallenbeck, M.D., Rochester, Minnesota.... 265

Treatment of Varicose Veins
A Twenty-five Year Reflection
H. O. McPheeters, M.D., Minneapolis, Minnesota.... 271

The Position of Radiology in Cardiovascular Diagnosis
Fred Jenner Hodges, M.D., Ann Arbor, Michigan...... 276

Chronic Pyuria
Diagnostic and Therapeutic Measures
C. D. Creevy, M.D., Minneapolis, Minnesota............ 281

Roentgenographic Findings in Respiratory Problems of Infants
S. B. Feinberg, M.D., Minneapolis, Minnesota.... ... 285

Electrolyte Disturbances in Dehydration
William M. Wallace, M.D., Cleveland, Ohio...... 290

SEMINAR

The Pyrrol Pigments and Hemoglobin Catabolism.
C. J. Watson, M.D., Minneapolis, Minnesota.......... 9

CONTINUATION STUDIES

Fractures of the Metacarpals, Metatarsals and Phalange
Lester W. Carlander, M.D., Minneapolis, Minnesota

CURRENT CARDIAC CONCEPTS

Diagnosis and Treatment of Thromboangiitis Obliterans (Buerger's Disease)
Nelson W. Barker, M.D., Rochester, Minnesota.. ..

PUBLIC HEALTH

Diagnostic Standards and Classification of Tuberculosis
E. A. Meyerding, M.D., Saint Paul, Minnesota.........

Official Journal of

Duluth Surgical Society
Minneapolis Academy of Medicine
Minneapolis Obstetrical and Gynecological Society
Minneapolis Surgical Society
Minnesota Academy of Medicine
Minnesota Obstetric and Gynecologic Society

Owner and Publisher

Published by MINNESOTA STATE MEDICAL ASSOCIATION
496 Lowry Medical Arts Building
St. Paul 2, Minnesota

Editing and Publishing Committee

E. M. Hammes, M.D.
Chairman, Saint Paul

F. M. Owens, Jr., M.D.
Saint Paul

T. A. Peppard, M.D.
Minneapolis

Henry Ulrich, M.D.
Minneapolis

Business Manager

R. R. Rosell
496 Lowry Medical Arts Building
St. Paul 2, Minnesota

GENE L

Authors

Manuscripts should be addressed to Arthur H. Wells, M.D., Editor, 915 East Street, Duluth 5, Minnesota. Telephone RA 7-6636 or JA 5-2319. Original papers prep for publication solely in Minnesota Medicine will be considered by the Board of Ec providing they fulfill the following editorial standards. Manuscripts should be t double spaced on white paper with at least 1-inch margins. The original (not a ca copy) is requested. The title on the first page should be under six words if pos or divided into two parts. The author should give his highest degree, his institut position or his relationship to a hospital or medical organization which he ma addressing. Pages should be numbered consecutively and the author's last name sh appear at the top of each page after the first page.

Biographical references should appear on a separate sheet entitled "Bibliography." should appear and be numbered consecutively in the order in which they first occ the text (not alphabetically). Citations in the text require reference numbers if author's or authors' names are not used or if there is more than one reference to same author or group of authors. All references to author should appear in Bibliography and no references should be included which are not in the text. The and exact punctuation used in the J.A.M.A. references is requested. For a journal th *Author's last name, initial, initial.: title of paper. Abbreviated name of journal, vo number: page, year.* Book references should give author, title, edition number, publisher and year.

Illustrations (photographs, tables and graphs) should be submitted separately and combined in the text. There should be a separate sheet entitled "Illustrations" w contains the various types of illustrations listed separately and numbered in the c

Medicine

May, 1956

Volume 39
Number 5

MISCELLANEOUS ARTICLES

TORIALS

anging Concepts in Psychosomatic Reactions 308
ammaglobulinemia 308
tate Planning for Physicians 309
int—Its Use and Value 310
e History of Glass Containers 311
ohol and Driving 311
e Treatment of Tuberculosis Today 312
ader Interest Poll 313

SIDENT'S LETTER

Tribute to Organized Medicine 314

DICAL ECONOMICS

ministration Opposes Disability Payments under Social Security 315
e Doctors Good Businessmen? 316
hat Do Doctors Think of Social Security? 316
tastrophic Health Insurance for Federal Employes 317
edical Library Bill 317
me Doctors Miss This Treat 317

THE DEAN'S PAGE

Leadership in Medicine 318
IN MEMORIAM 319
MEETINGS AND ANNOUNCEMENTS 321
WOMAN'S AUXILIARY 322
MINNESOTA STATE MEDICAL ASSOCIATION—ROSTER 1956 323

GENERAL INTEREST

Personal Items 358
Blue Cross-Blue Shield News A-35
BOOK REVIEWS A-38
CLASSIFIED ADVERTISING A-42
INDEX TO ADVERTISERS A-46

innesota Society of Clinical Pathologists
innesota Society of Internal Medicine
innesota Society of Neurology and Psychiatry

Minnesota State Medical Association
Minnesota Surgical Society
Northern Minnesota Medical Association
Southern Minnesota Medical Association

ORMATION

hich they appear in the text. All photographs must be in black and white, clear contrasting, and on glossy prints. Instructions for combining photographs are table. Any number of illustrations over 4 are charged to the author. Combinations otographs up to one-half page (6 x 4⅜ inches) count as 1 illustration.

lers and Reviewers

e right is reserved to reject material submitted for reading or advertising columns. views expressed in this journal do not necessarily represent those of the Minnesota Medical Association or any of its constituents.

rtisers and Subscribers

ssified advertising—10 cents a word; minimum charge $2.00; key number, 25c ional. Remittance should accompany order. Display advertising rates on request.

nual Subscription—$3.00. Single Copies—$0.40. Foreign and Canadian—$3.50.

mmunications concerning advertising and subscriptions should be addressed to ESOTA MEDICINE, 2642 University Avenue, Saint Paul 14, Minnesota. Telephone Mid-5-2641.

yright and Post Office Entry

ntents of MINNESOTA MEDICINE ©1956 by Minnesota State Medical Association.

tered at the Post Office in Saint Paul as second class matter. Accepted for mailing at special rate of postage provided for in Section 1103, Act of October 3, 1917, orized July 13, 1918.

Board of Editors

ARTHUR H. WELLS, M.D.
Editor-in-Chief, Duluth

STUART W. ARHELGER, M.D.
Minneapolis

JOHN F. BRIGGS, M.D.
Saint Paul

S. FRANCIS CEPLECHA, M.D.
Redwood Falls

TAGUE C. CHISHOLM, M.D.
Minneapolis

ROBERT B. HOWARD, M.D.
Minneapolis

R. DREW MILLER, M.D.
Rochester

HENRY G. MOEHRING, M.D.
Duluth

GLENN J. MOURITSEN, M.D.
Fergus Falls

OLIVE V. SEIBERT, B.A.
Saint Paul

GEORGE STILWELL, M.D
Rochester

Get the Facts!!

about the

PROFESSIONAL CREDIT PROTECTIVE BUREAU

The Professional Credit Protective Bureau has proved very beneficial to many professional people who have adopted this excellent credit control and collection service.

We urge you to make use of this service since it will be of great benefit in recovering long delinquent accounts and in eliminating, through proper control measures, the accumulation of slow and bad accounts.

Professional Credit Protective Bureau
701 Metropolitan Bldg., Minneapolis 1, Minn.

YES, I would like to give the PROFESSIONAL CREDIT PROTECTIVE BUREAU a trial. Please ask one of their representatives to call on me without obligation to explain the plan in detail.

NAME ....

ADDRESS ....

THE MILTOWN MOLECULE

the tranquilizer with
NO KNOWN CONTRA-INDICATIONS
ideal for prolonged therapy

- Effective in anxiety, tension and muscle spasm
- Well tolerated—not habit forming—essentially non-toxic
- Does not produce depression
- Orally effective within 30 minutes for a period of 6 hours
- Supplied in 400 mg. tablets. Usual dose: 1 or 2 tablets—3 times a day

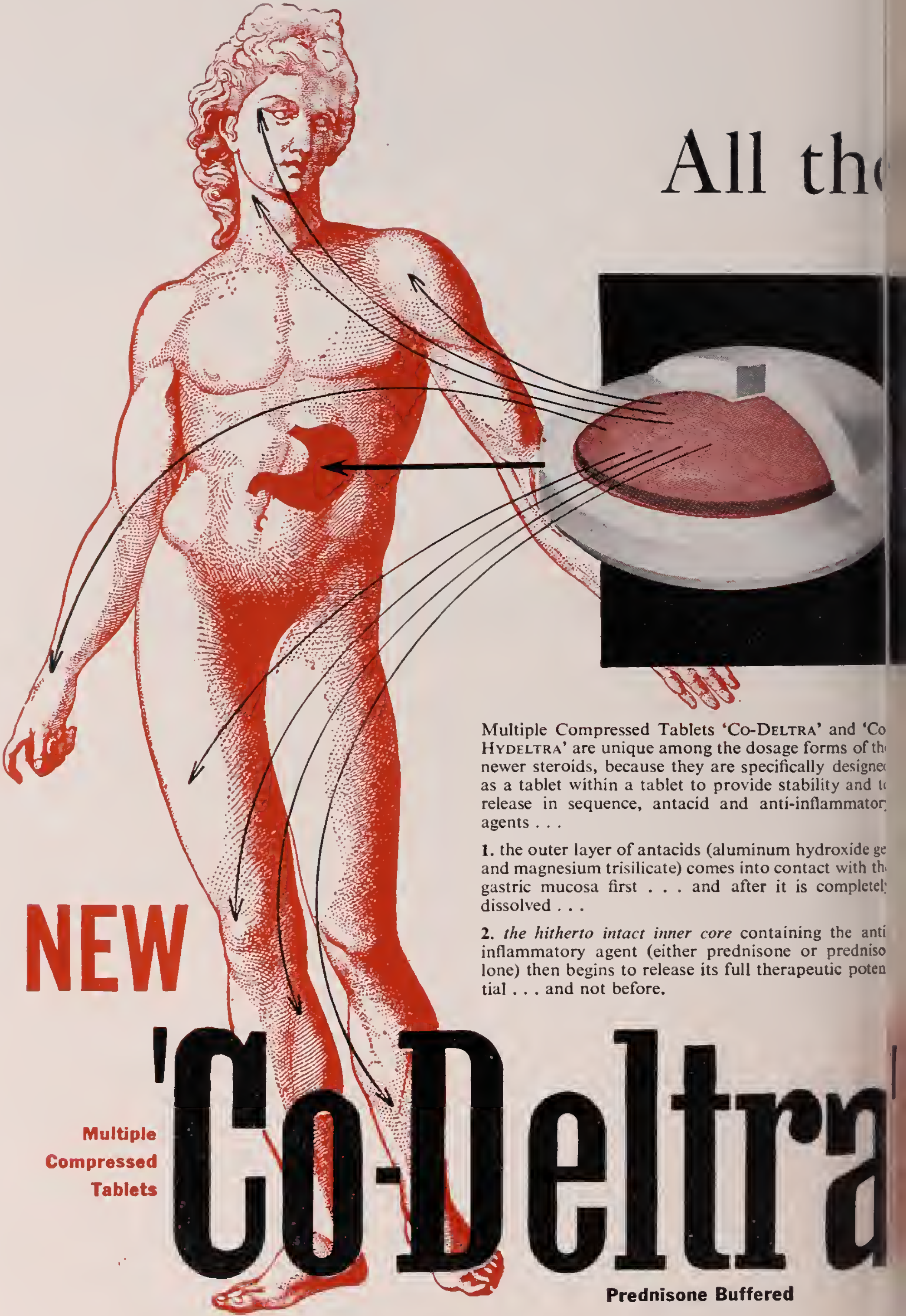
Miltown®

the original meprobamate—2-methyl-2-*n*-propyl-1,3-propanediol dicarbamate—U.S. Patent 2,724,720

DISCOVERED AND INTRODUCED by ***Wallace Laboratories, New Brunswick, N. J.***

Literature and Samples Available on Request

All th



Multiple Compressed Tablets 'Co-Deltra' and 'Co
Hydeltra' are unique among the dosage forms of th
newer steroids, because they are specifically designe
as a tablet within a tablet to provide stability and t
release in sequence, antacid and anti-inflammator
agents . . .

1. the outer layer of antacids (aluminum hydroxide ge
and magnesium trisilicate) comes into contact with th
gastric mucosa first . . . and after it is completel
dissolved . . .

2. *the hitherto intact inner core* containing the anti
inflammatory agent (either prednisone or predniso
lone) then begins to release its full therapeutic poten
tial . . . and not before.

NEW

Multiple
Compressed
Tablets

'Co-Deltra

Prednisone Buffered

benefits of prednisone and prednisolone plus positive antacid action to minimize gastric distress...

A reportedly higher incidence of gastric distress in patients receiving the newer steroids prednisone and prednisolone indicates the desirability of co-administering non-systemic antacids.[1]

To help the physician cope with this problem of gastric distress which might otherwise become an obstacle to therapy with the newer steroids . . . Multiple Compressed Tablets 'CO-DELTRA' (Prednisone Buffered) and 'CO-HYDELTRA' (Prednisolone Buffered) are now available.

'CO-DELTRA' and 'CO-HYDELTRA' are now available in bottles of 30 on your prescription. Each Multiple Compressed Tablet contains:

Prednisone or Prednisolone, 5 mg.; 300 mg. of dried aluminum hydroxide gel, U.S.P., and 50 mg. of magnesium trisilicate.

'CO-DELTRA' and 'CO-HYDELTRA'
are trade-marks of MERCK & CO., INC.

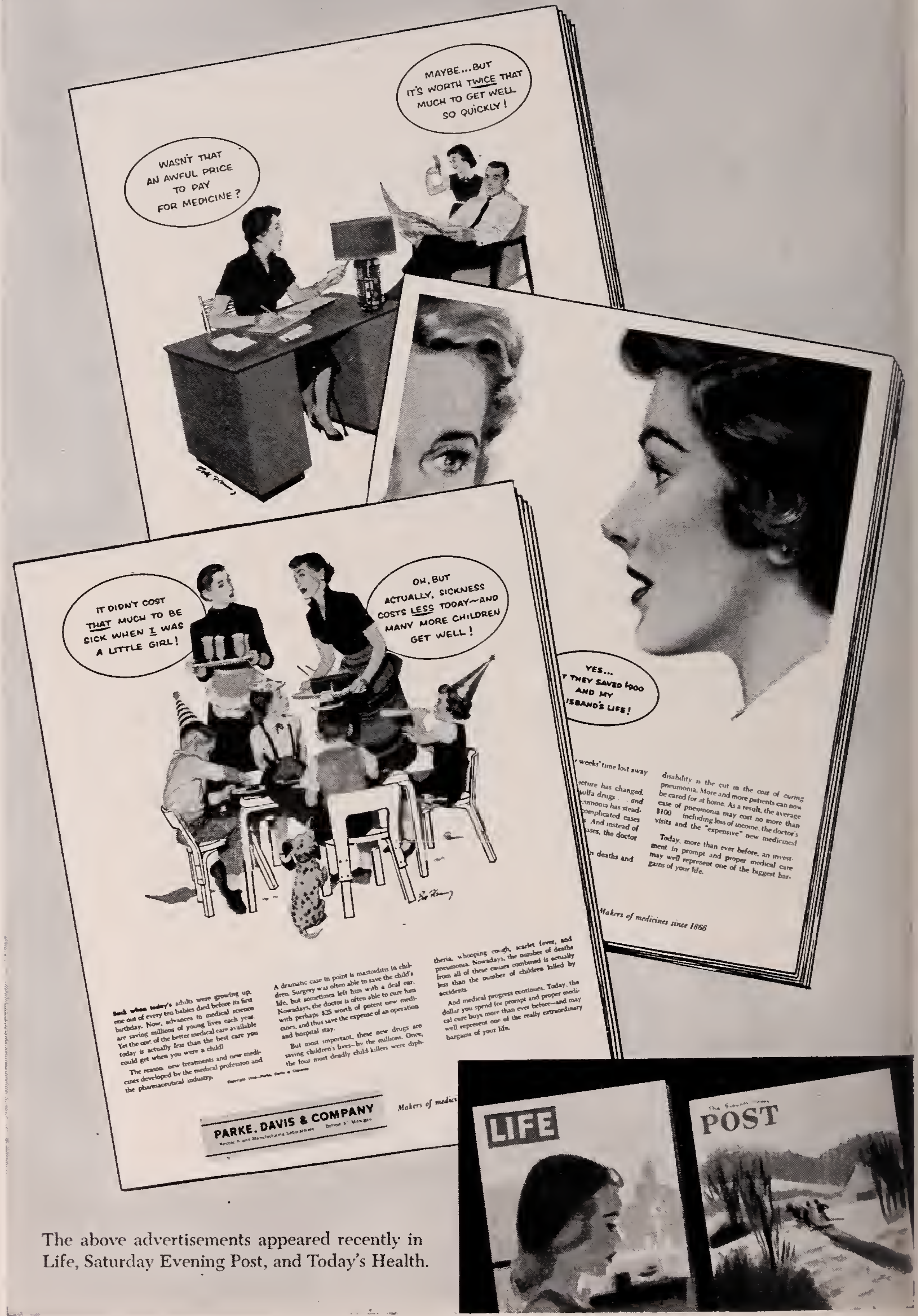
1. Bollet, A. J., Black, R., and Bunim, J. J.: *J.A.M.A.* **158**: 459, June 11, 1955.

Co-Hydeltra'

Prednisolone Buffered

SHARP & DOHME

Philadelphia 1, Pa.
DIVISION OF MERCK & CO., INC.


WASN'T THAT AN AWFUL PRICE TO PAY FOR MEDICINE?
MAYBE...BUT IT'S WORTH TWICE THAT MUCH TO GET WELL SO QUICKLY!
YES... THEY SAVED $900 AND MY USBAND'S LIFE!
IT DIDN'T COST THAT MUCH TO BE SICK WHEN I WAS A LITTLE GIRL!
OH, BUT ACTUALLY, SICKNESS COSTS LESS TODAY—AND MANY MORE CHILDREN GET WELL!
LIFE
POST

weeks' time lost away

…cture has changed.
…ulfa drugs . . . and
…umonia has stead-
…complicated cases
… And instead of
…ases, the doctor

…n deaths and

disability is the cut in the cost of curing pneumonia. More and more patients can now be cared for at home. As a result, the average case of pneumonia may cost no more than $100 . . . including loss of income, the doctor's visits and the "expensive" new medicines!

Today, more than ever before, an investment in prompt and proper medical care may well represent one of the biggest bargains of your life.

Makers of medicines since 1866

Back when today's adults were growing up, one out of every ten babies died before its first birthday. Now, advances in medical science are saving millions of young lives each year. Yet the cost of the better medical care available today is actually *less* than the best care you could get when you were a child!

The reason: new treatments and new medicines developed by the medical profession and the pharmaceutical industry.

A dramatic case in point is mastoiditis in children. Surgery was often able to save the child's life, but sometimes left him with a deaf ear. Nowadays, the doctor is often able to cure him with perhaps $25 worth of potent new medicines, and thus save the expense of an operation and hospital stay.

But most important, these new drugs are saving children's lives—by the millions. Once, the four most deadly child-killers were diphtheria, whooping cough, scarlet fever, and pneumonia. Nowadays, the number of deaths from all of these causes combined is actually less than the number of children killed by accidents.

And medical progress continues. Today, the dollar you spend for prompt and proper medical cure buys more than ever before—and may well represent one of the really extraordinary bargains of your life.

Copyright 1950—Parke, Davis & Company

PARKE, DAVIS & COMPANY
Research and Manufacturing Laboratories Detroit 32, Michigan

Makers of medic

The above advertisements appeared recently in Life, Saturday Evening Post, and Today's Health.

"How to look at a doctor's bill" could well serve as the title for recent Parke-Davis advertisements on the cost of medical care. For they suggest to the public new ways of looking at the extraordinary *value* one buys with each dollar spent for prompt and proper medical care.

These Parke-Davis messages talk in everyday language about familiar but "forgotten" facts. Some examples: the steadily decreasing cost of curing diseases such as pneumonia, the phenomenal reduction in the death-rate for children, the substantial savings in time and income because of the shortened duration of hospital stays.

By highlighting the heartening facts of medical progress in relation to the cost of medical care, this new series hopes to help in creating a healthy, realistic public opinion on the reasonableness of medical costs.

To do this successfully, we wish the facts to have the widest possible readership. Therefore these advertisements are being published regularly in such mass-circulation magazines as LIFE, the SATURDAY EVENING POST, and TODAY'S HEALTH.

If you would like to have folder-size reprints of any of these ads for your reception room, we will be happy to supply them on request.

today's health

PARKE, DAVIS & COMPANY

Detroit 32, Michigan

DOCTORS EVERYWHERE NOW KNOW WHY

Viceroys Are Smoother

THE VICEROY TIP HAS . . .
TWICE AS MANY FILTERS

Professional men who have studied the microscopic analysis of the Viceroy filter now know why the Viceroy taste is smoother—never rough. Only Viceroy has 20,000 tiny filters in every tip—twice as many filters as the other two largest-selling filter brands. That is why Viceroys are smoother by far—never, never rough. That is why so many doctors now smoke and recommend Viceroys.

Yes, smoother taste because there are

TWICE AS MANY FILTERS IN EVERY VICEROY TIP

as the other two largest-selling filter brands!

Viceroy
TWICE AS MANY FILTERS
Brand B
Only HALF the FILTERS
Brand C
LESS than HALF the FILTERS

Viceroy's exclusive filter is made from pure cellulose—soft, snow-white, natural!

VICEROY
TWENTY
VICEROY
Filter Tip
CIGARETTES
KING-SIZE

Upjohn

Rheumatoid arthritis, rheumatic fever, intractable asthma, allergies . . .

Cortef* *tablets*

Supplied:

5 mg. tablets in bottles of 50
10 mg. tablets in bottles of 25, 100, 500
20 mg. tablets in bottles of 25, 100, 500

*REGISTERED TRADEMARK FOR THE UPJOHN
BRAND OF HYDROCORTISONE (COMPOUND F)

The Upjohn Company, Kalamazoo, Michigan

25 Compressed Tablets
Cortef*, 20 mg.
Brand of hydrocortisone
Each tablet contains:
20
Directions for use—See accompanying insert.
The Upjohn Company
Kalamazoo, Michigan

CHILDREN'S SIZE BAYER ASPIRIN
FLAVORED
Children's Size
BAYER
ASPIRIN
BAYER
Genuine
24 TABLETS
2½ gr. ea.
PRICE 15¢
½ TABLET = 1¼ gr.
THE BEST TASTING ASPIRIN
YOU CAN GIVE YOUR CHILD
DR.
℞

How to win *little* friends . . .

The Best Tasting Aspirin you can prescribe.

The Flavor Remains Stable down to the last tablet.

15¢ Bottle of 24 tablets (2½ grs. each).

We will be pleased to send samples on request.

THE BAYER COMPANY DIVISION
of Sterling Drug Inc.
1450 Broadway, New York 18, N. Y.

clinical
advantages
with

TETRACYN®

BRAND OF TETRACYCLINE

TEMPERATURE CHART

- rapid absorption and distribution to all parts of the body
- prompt, broad-spectrum action against infections caused by gram-positive and gram-negative bacteria, spirochetes, certain large viruses and protozoa
- minimal incidence of adverse reactions
- available in a wide selection of convenient dosage forms for oral, parenteral or topical use

Tetracycline the nucleus of modern broad-spectrum activity discovered and identified by Pfizer scientists

Pfizer

PFIZER LABORATORIES
Division, Chas. Pfizer & Co., Inc.
Brooklyn 6, N. Y.

Introducing

A.P.C. WITH **Demerol**®

Tablets

for more efficient

CONTROL OF *Pain*

Each tablet contains:

Aspirin	200 mg.	(3 grains)
Phenacetin	150 mg.	(2½ grains)
Caffeine	30 mg.	(½ grain)
Demerol hydrochloride	30 mg.	(½ grain)

Average Adult Dose: 1 or 2 tablets repeated in three or four hours as needed.

Bottles of 100 tablets. *Narcotic blank required.*

"Such a combination has proven clinically to be far more effective and no more toxic than equivalent doses of any of these used singly."*

Winthrop LABORATORIES
NEW YORK 18, N. Y.

*Bonica, J.J.; and Backup, P.H.: Northwest Med., 54:22, Jan. 1955.

Demeral, trademark reg. U.S. Pat. Off., brand of meperidine, – May be habit forming

All the benefits of prednisone and prednisolone plus positive antacid action to minimize gastric distress

Multiple Compressed Tablets of 'Co-Deltra' and 'Co-Hydeltra' are designed to help the physician cope with the problem of gastric distress which might otherwise become an obstacle to therapy with the newer steroids prednisone and prednisolone. Each Multiple Compressed Tablet is specifically formulated as a "tablet within a tablet" to provide stability and to release in sequence antacid and anti-inflammatory components.

NEW

'Co-Hydeltra'

Prednisolone Buffered

and

'Co-Deltra'

Prednisone Buffered

MULTIPLE COMPRESSED TABLETS

Supplied: Multiple Compressed Tablets of 'Co-Deltra' and 'Co-Hydeltra', each containing 5 mg. prednisone or prednisolone, 300 mg. of dried aluminum hydroxide gel, U.S.P., and 50 mg. of magnesium trisilicate, U.S.P., bottles of 30 tablets.

'Co-Deltra' and 'Co-Hydeltra' are the trademarks of Merck & Co., Inc.

SHARP & DOHME

Philadelphia 1, Pa.
Division of Merck & Co., Inc.

Combat the debilitating effects of aging

GYNETONE REPETABS

Combined estrogen-androgen therapy provides the steroid support necessary for maximum physical and mental function in both males and females who would enjoy vigorous living in the years beyond 60. With GYNETONE REPETABS, optimally balanced estrogen-androgen, increased vitality as well as elevation of mental and emotional levels often follow therapy and help to keep the aging patient a productive and useful member of society.

also valuable in: osteoporosis • protein depletion • menopause

two strengths for individualized therapy

GYNETONE REPETABS ".02": Ethinyl Estradiol U.S.P. 0.02 mg. plus 5 mg. Methyltestosterone U.S.P.

GYNETONE REPETABS ".04": Ethinyl Estradiol U.S.P. 0.04 mg. plus 10 mg. Methyltestosterone U.S.P.

GYNETONE,® combined estrogen-androgen.
REPETABS,® Repeat Action Tablets. GT-J-62-256

unchanged life
in the changing years
Schering
GYNETONE
REPETABS
SCHERING

two strengths

0.02 mg. ethinyl estradiol plus 5 mg. Methyltestosterone U.S.P.
0.04 mg. ethinyl estradiol plus 10 mg. Methyltestosterone U.S.P.

GYNETONE,® combined estrogen-androgen.
REPETABS,® Repeat Action Tablets. GT-J-61-256

Schering
REPETABS
SCHERING

standard
for therapeutic
convenience

daylong relief from a single dose

Chlor-Trimeton Repetabs 8 and 12 mg.
Prantal Repetabs 100 mg.
Gynetone Repetabs ".02" and ".04"

Chlor-Trimeton® Maleate, brand of chlorprophenpyridamine maleate.
Prantal® Methylsulfate, brand of diphemanil methylsulfate.
Gynetone,® combined estrogen-androgen.
Repetabs,® Repeat Action Tablets.

M-J-62-356

in rheumatoid arthritis

STANDING

is easier with STERANE[1]—
3-5 times more potent
than hydrocortisone or
cortisone.[2]

WALKING

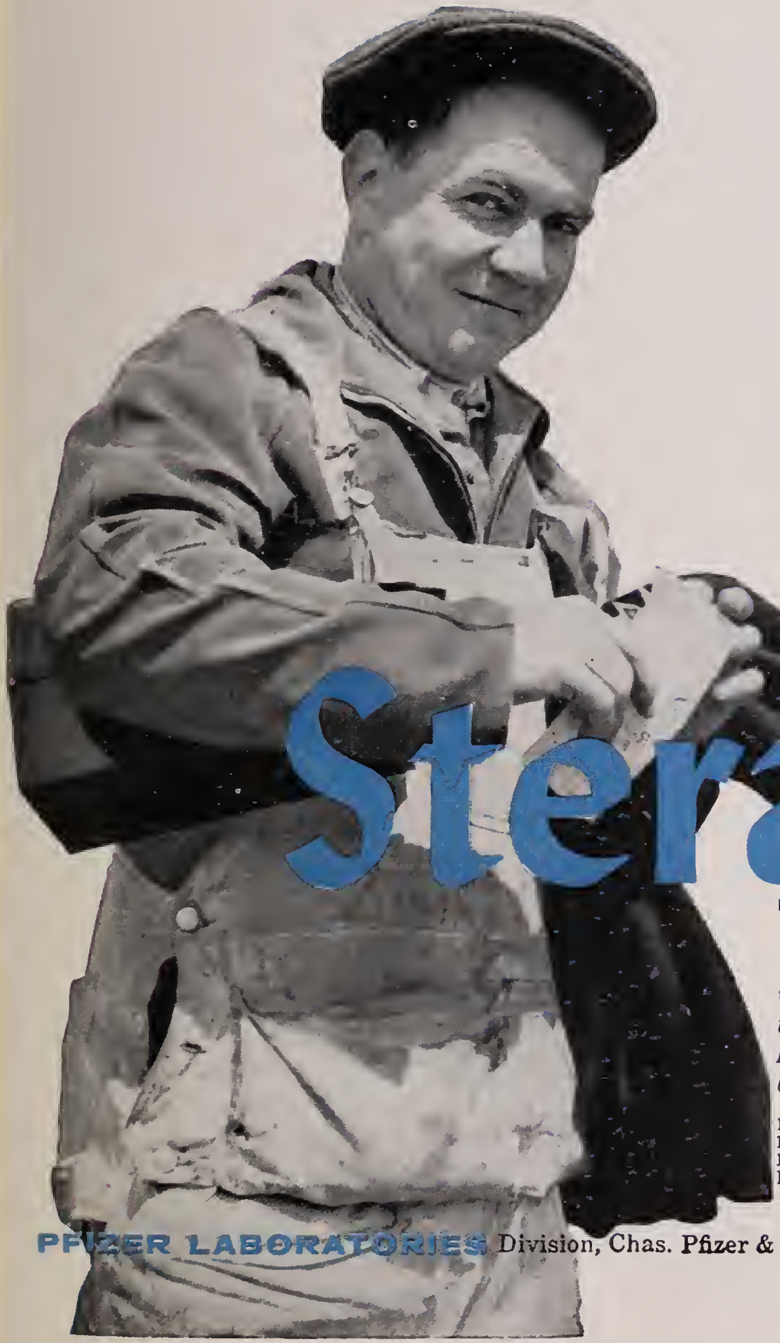
follows rapidly.[1] STERANE
"is more effective than any
previous drug in the control
of... rheumatoid arthritis."[3]

WORKING

functional mobility is
restored even where other
steroids fail or cease to
be effective.[2,3]

WITH MINIMAL DISTURBANCE

of electrolyte balance[1-3]—
patients may even be treated
without diet restrictions.



Sterane®

brand of prednisolone

supplied: *White, 5 mg. oral tablets, bottles of 20 and 100. Pink, 1 mg. oral tablets, bottles of 100.*

1. Spies, T. D., et al.: GP 12:73, No. 1, 1955. 2. Boland, E. W.: J.A.M.A. 160:613, 1956. 3. Gillhespy, R. O. Lancet 2:1393, 1955.

PFIZER LABORATORIES Division, Chas. Pfizer & Co., Inc. Brooklyn 6, New York

how bioflavonoids with ascorbic acid help in threatened and habitual abortion...

Frequent nosebleeds, gum bleeding and easy bruising were observed in a high percentage of women who had repeated abortions, according to one study.[1]

Another investigator[2] reported abnormal capillary fragility in 80% of habitual aborters.

Bioflavonoids with ascorbic acid help to diminish abnormal capillary permeability and fragility by acting to maintain the integrity of the "cement" substance of capillary walls. Thus, C.V.P. may be a helpful adjunct in the management of threatened and habitual abortion.

C.V.P. provides the capillary-protectant factors of whole citrus bioflavonoid compound (sometimes referred to as "vitamin P complex"), combined with ascorbic acid. C.V.P. is water-soluble and believed to be more readily absorbed than relatively insoluble rutin.

CVP®

Each C.V.P. capsule or each teaspoonful (5 cc.) of syrup provides:

Citrus Flavonoid Compound . . .	100 mg.
Ascorbic Acid (Vitamin C)	100 mg.

Bottles of 50, 100, 500 and 1000 capsules; 4 oz., 16 oz. and gallon syrup.

1. Science News Letter, March 1954
2. Greenblatt, R. B.: Obstet. & Gyn. 2:530, 1953

samples and literature from **u. s. vitamin corporation**
(Arlington-Funk Laboratories, division)
250 East 43rd Street, New York 17, N.Y.

in
rheumatoid
arthritis

continuing benefits

for successful corticosteroid therapy

METICORTELONE*

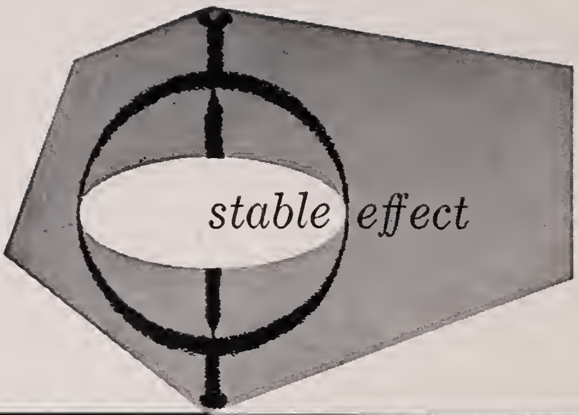
(PREDNISOLONE)

- therapy usually undisturbed by sodium retention, edema, weight gain
- excellent relief of arthritic pain, swelling, tenderness
- spares patients salt-poor diets
- up to 5 times as potent as hydrocortisone

Available as 1, 2.5, and 5 mg. tablets; 2.5 and 5 mg. capsules

METICORTELONE,* brand of prednisolone. *T.M. ML-J-66-255

Schering



RAUDIXIN

SQUIBB WHOLE ROOT RAUWOLFIA SERPENTINA

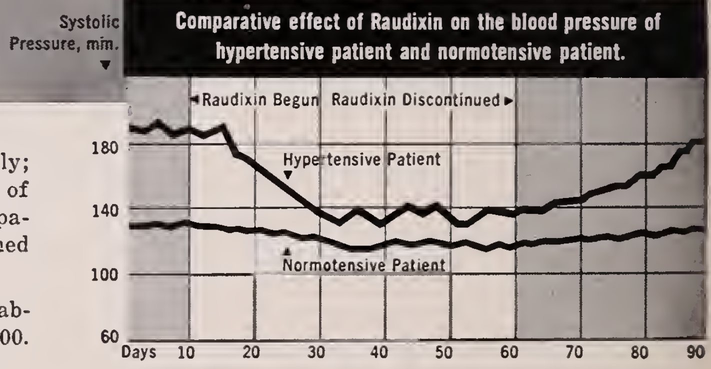
in anxiety and tension states . . .

stable ataractic (tranquilizing) effect
without excessive sedation

in hypertension . . .

stable hypotensive effect without rapid peaks and
declines in blood pressure

Comparative effect of Raudixin on the blood pressure of hypertensive patient and normotensive patient.



The hypotensive action of Raudixin is selective for the hypertensive state. For this reason, Raudixin does not significantly affect the blood pressure of normotensive patients.

DOSAGE: 100 mg. b.i.d. initially; may be adjusted within a range of 50 mg. to 500 mg. daily. Most patients can be adequately maintained on 100 mg. to 200 mg. daily.

SUPPLY: 50 mg. and 100 mg. tablets, bottles of 100, 1000 and 5000.

SQUIBB

'RAUDIXIN'® IS A SQUIBB TRADEMARK

Reduces Muscular Tension

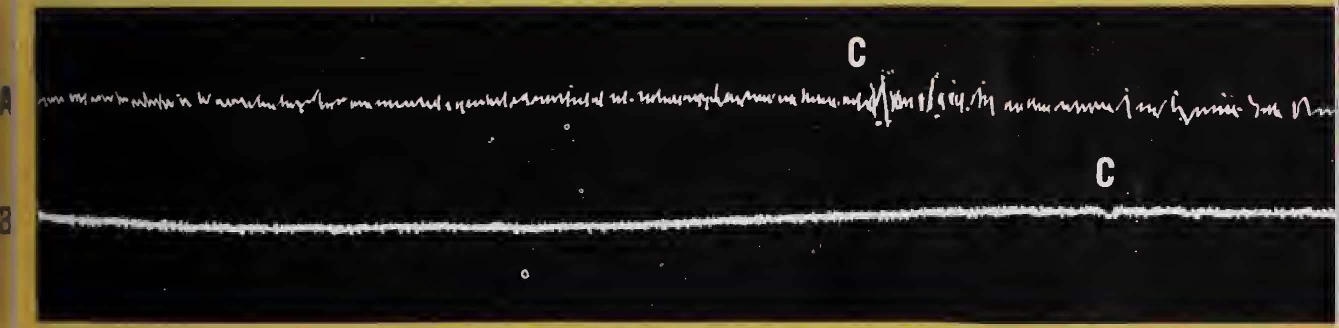
Equanil*

MEPROBAMATE

(2-methyl-2-*n*-propyl-1,3-propanediol dicarbamate)

Licensed under U.S. Patent No. 2,724,720

Electromyography shows decisive response



Electromyographic study of neuromuscular hyperactivity in 42-year-old male with anxiety-tension syndrome. A, Before EQUANIL; action potential of high amplitude and frequency. B, After one week of ambulatory treatment with EQUANIL; showing definite reduction in tension, greater ability to relax, and marked improvement in muscular coordination. C, Point where patient makes effort to relax.[1]

The remarkable effectiveness of EQUANIL may be demonstrated in two ways. One is by its ability to relieve muscle spasm and neuromuscular tension.[1] The second is by its ability to relieve mental tension and anxiety.

Usual dosage: 1 tablet t.i.d. The dose may be adjusted either up or down, according to the clinical response of the patient.

Supplied: Tablets, 400 mg., bottles of 50.

1. Dickel, H.A., et al.: West. J. Surg., April, 1956.

anti-anxiety factor
with muscle-relaxing action
. . . relieves tension

Wyeth®
Philadelphia 1, Pa.

*Trademark

WHY
SENSITIZE

in topical and ophthalmic infections

USE
'POLYSPORIN'®
brand

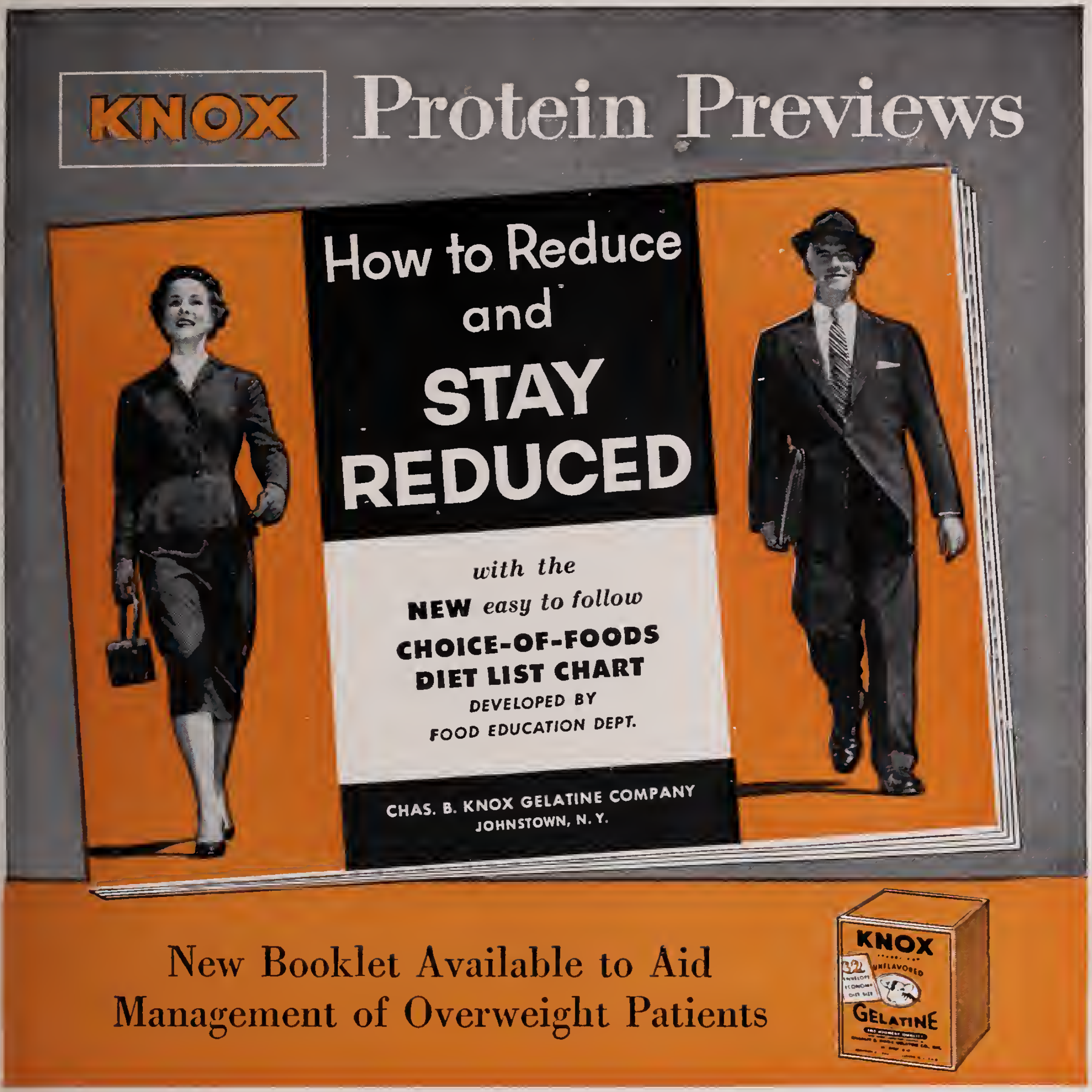
POLYMYXIN B—BACITRACIN OINTMENT

to insure broad-spectrum therapy
with minimum allergenicity

For topical use: in ½ oz. and 1 oz. tubes.

For ophthalmic use: in ⅛ oz. tubes.

BURROUGHS WELLCOME & CO. (U.S.A.) INC., Tuckahoe, N. Y.


KNOX
How to Reduce and STAY REDUCED
with the NEW easy to follow CHOICE-OF-FOODS DIET LIST CHART
DEVELOPED BY FOOD EDUCATION DEPT.
CHAS. B. KNOX GELATINE COMPANY
JOHNSTOWN, N. Y.
KNOX
UNFLAVORED
GELATINE

KNOX Protein Previews

New Booklet Available to Aid Management of Overweight Patients

The 1955 edition of the well-known Knox "Eat-and-Reduce" booklet eliminates calorie counting for your obese patients. This year's edition is based on the use of Food Exchange Lists[1] which have proved so accurate in the dietary management of diabetics. These lists have been adapted to the dietary needs of patients who must lose weight.

The first 18 pages of the new booklet present in simple terms key information on the use of Food Exchanges (referred to in the book as Choices). In the center, double gatefold pages outline color-coded diets of 1200, 1600, and 1800 calories based on the Food Exchanges. Physicians will find these diets easy to revise to meet the special needs of individual patients.

To help patients persevere in their reducing plans, the last 14 pages of the new Knox booklet are devoted to more than six dozen *tested*, low-calorie recipes. Please use the coupon below to obtain copies of the new "Eat-and-Reduce" booklet for your practice.

---

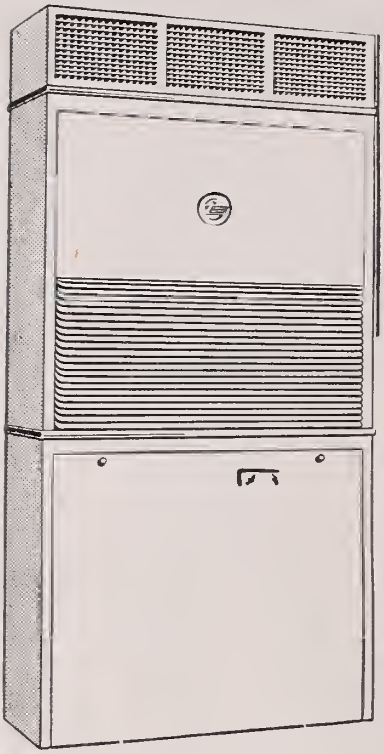
[1] Developed by the U. S. Public Health Service assisted by committees of The American Diabetes Assn., Inc. and The American Dietetic Assn.

Chas. B. Knox Co., Inc.
Professional Service Dept. SJ-17
Johnstown, N. Y.

Please send me.........copies of the new illustrated Knox "Eat-and-Reduce" booklet based on Food Exchanges.

Your patients don't ask for it . . . BUT . . .

Airtemp
DIVISION
CHRYSLER CORP



AIR CONDITIONING IS AN INVESTMENT THAT PAYS FOR ITSELF . . . *fast!*

Airtemp air conditioning puts your patients at ease and increases office efficiency when outside temperatures soar. Airtemp engineering offers trouble-free performance unmatched in the air conditioning field.

"Packaged" units for every size office or clinic.

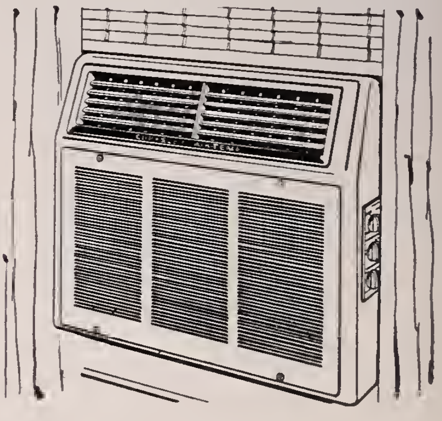
Completely contained units, quickly installed without duct work or remodeling. Sizes from 2 to 30 horsepower . . . 13 different models.

WATERLESS AIR CONDITIONING INSTALLED AS EASILY AS A REFRIGERATOR

No plumbing . . . no water needed! Saves floor space. Entire unit warranted for 5 years.

New!
All-in-window
ROOM AIR CONDITIONERS
Does not protrude beyond window sill.
Exclusive with AIRTEMP

A new . . . *all new* . . . streamlined room air conditioner that is completely contained within the window. Completely automatic. Filters, de-humidifies, and cools air in one operation. Adjustable fins eliminate drafts. Many sizes for any need. Also units for casement windows. No water or plumbing needed. Low installation cost.



There is an Airtemp dealer near you who will give you a survey and estimate FREE!

Globe Inc.

Exclusive Airtemp distributor
601 No. Washington, MINNEAPOLIS
MANKATO—BISMARCK

now what?

Every call is a new challenge. If you find the patient has a bacterial infection you may, like many physicians, think of Gantrisin 'Roche' first. For Gantrisin is highly soluble, well tolerated, and effective against a wide range of pathogens.

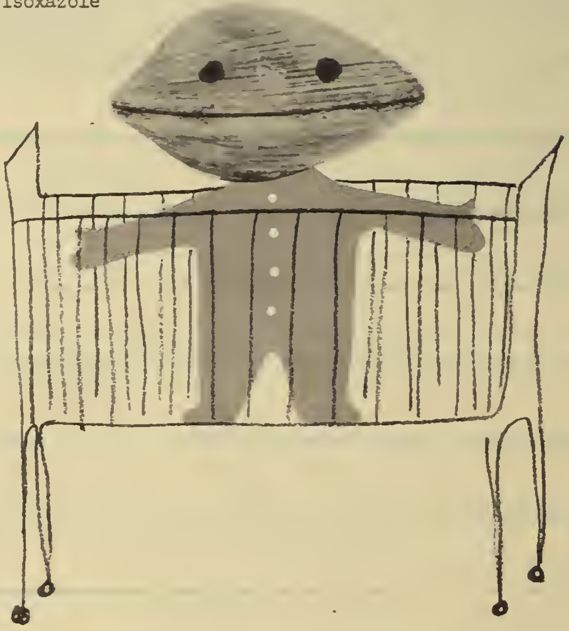
Gantrisin® - brand of sulfisoxazole

How many of your patients are clams?

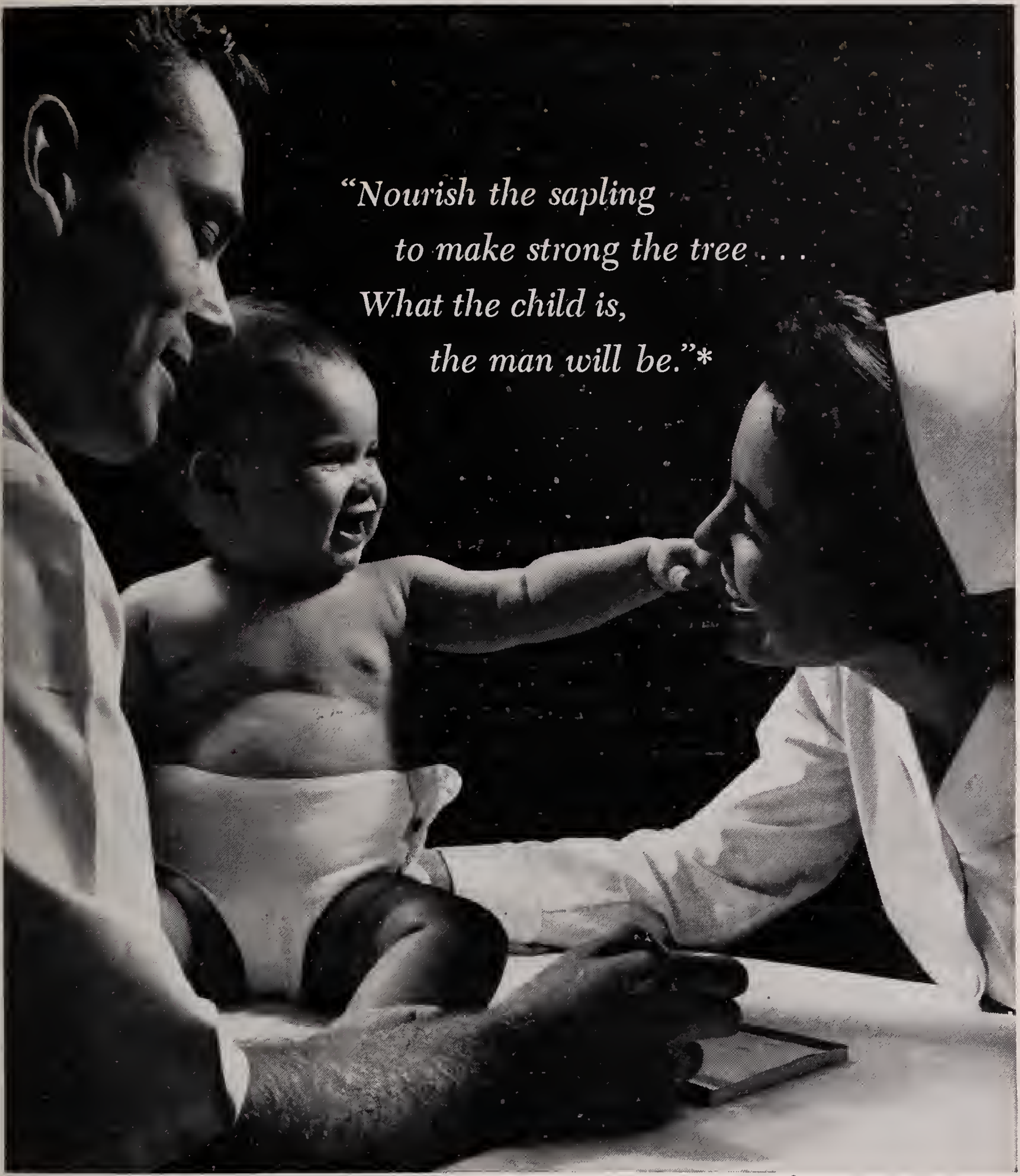
... most youngsters to be sure -
and many oldsters, too - who balk at pills.

Gantrisin (acetyl) Pediatric Suspension solves the problem because its delicious raspberry flavor appeals to all ages, while the wide spectrum and extensive clinical background of Gantrisin assure you of effective, well-tolerated antibacterial therapy.

Gantrisin® - brand of sulfisoxazole
Gantrisin®(acetyl) - brand of acetyl sulfisoxazole



ROCHE Original Research in Medicine and Chemistry


"Nourish the sapling
to make strong the tree . . .
What the child is,
the man will be."*

*© 1930, MEAD JOHNSON & CO

You can specify **PABLUM**® *with confidence*

All physicians appreciate the strictness of pharmaceutical standards. Pablum Cereals are the *only* baby cereals made by nutritional and pharmaceutical *specialists.* All four Pablum Cereals are enriched with thiamine, riboflavin, calcium, phosphorus, copper, and with iron in its most assimilable form.

PABLUM
Mixed Cereal
PABLUM
Oatmeal
PABLUM
Barley Cereal
PABLUM
Rice Cereal

Now available in these bright new packages.

Pablum Products DIVISION OF MEAD JOHNSON & COMPANY, EVANSVILLE, IND. • Manufacturers of nutritional and pharmaceutical products

A MODERN
PRIVATE
SANITARIUM

for the
Diagnosis, Care
and Treatment
of Nervous
and Mental
Disorders

MAIN BUILDING—One of 10 Units in "Cottage Plan"

ST. CROIXDALE ON LAKE ST. CROIX

PRESCOTT, WISCONSIN

Located on beautiful Lake St. Croix, 18 miles from the Twin Cities, it has the advantages of both City and Country. Every facility for treatment provided, including recreational activities and occupational-therapy under trained personnel. Close personal supervision given patients, and modern methods of therapy employed. Inspection and cooperation by reputable physicians invited. Rates very reasonable. Illustrated folder on request.

Prescott Office
Prescott, Wisconsin
Howard J. Laney, M.D.
Tel. 39 and Res., 76

Consulting Neuro-Psychiatrists
Hewitt B. Hannah, M.D., Andrew J. Leemhuis, M.D.
527 Medical Arts Bldg., Tel. FE. 2-1357, Minneapolis, Minn.

Superintendent
Ella M. Leseman
Prescott, Wisconsin
Tel. 69

New STEELINE Pediatric Table

Eases the burden of the physician's daily work

Includes built-in tare balance scale, built-in measuring rod, foam rubber cushion and electrical outlets with cord and plug—there are no accessories to buy. Top quality construction features include all-welded steel body, two roomy drawers and a large open compartment with shelf, providing easy, unhampered access to instruments and supplies. Front edge is protected from wear by a stainless steel baffle plate. Despite the fact that this new table has been designed to provide the physician with the best modern equipment, efficient modern production methods in our own factory permit us to keep the price well below that of comparable models. Write today for complete information.

a. s. aloe company OF MINNESOTA
927 Portland Avenue, Minneapolis 4, Minn. • Phone:

looked over often...

the patient with nonspecific rheumatism

NOW—thoroughgoing relief with

NEW
SIGMAGEN
TABLETS

combining

Prednisone	0.75 mg.	—best of the new
Acetylsalicylic acid . . .	325 mg.	—best of the old
Ascorbic acid	20 mg.	
Aluminum hydroxide . .	75 mg.	

antirheumatic • anti-inflammatory • analgesic • supportive

Combined effectiveness of the antirheumatic agents in SIGMAGEN permits maintenance of clinical relief at minimal dosages.

SIGMAGEN,* brand of corticoid-analgesic compound.
*T.M.

Schering

SG-J-51

for your complete insurance needs . . .

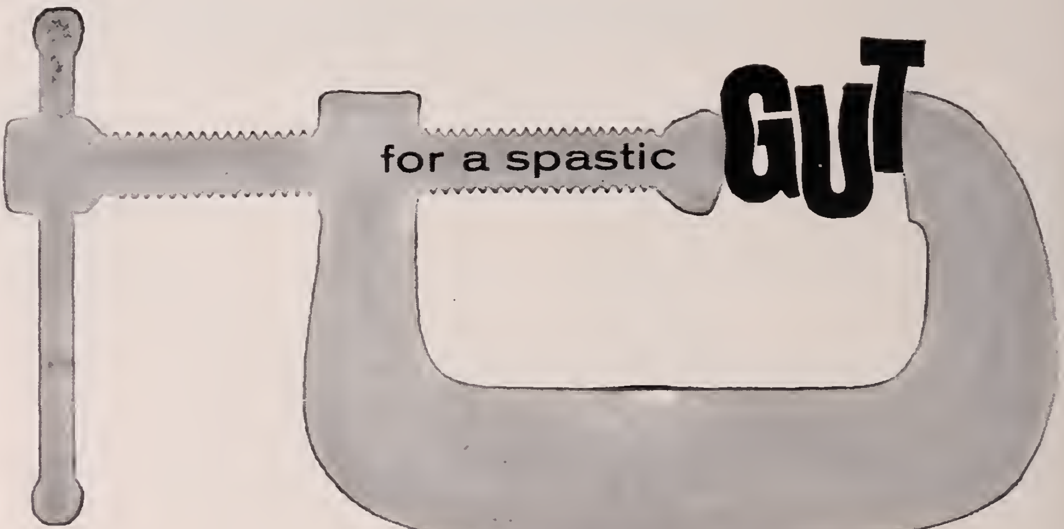
☆ PROFESSIONAL
☆ PERSONAL
☆ PROPERTY

CHOICE OF THE MINNESOTA MEDICAL ASSOCIATION FOR PROFESSIONAL LIABILITY INSURANCE

ST. PAUL FIRE AND MARINE • ST. PAUL MERCURY INDEMNITY CO. • MERCURY INSURANCE CO •
The Saint Paul Companies
SINCE 1853
INSURANCE
LAND • SEA • AIR

THERE IS A SAINT PAUL AGENT IN YOUR COMMUNITY
AS CLOSE AS YOUR PHONE

HOME OFFICE: 111 WEST FIFTH STREET, SAINT PAUL 2, MINNESOTA



Trasentine®-Phenobarbital

integrated relief . . .
mild sedation
visceral spasmolysis
mucosal analgesia

TABLETS *(yellow, coated), each containing 50 mg. Trasentine® hydrochloride (adiphenine hydrochloride CIBA) and 20 mg. phenobarbital.*

2/2228M

C I B A
Summit, N. J.

All the benefits of prednisone and prednisolone plus positive antacid action to minimize gastric distress

Multiple Compressed Tablets of 'Co-Deltra' and 'Co-Hydeltra' are designed to help the physician cope with the problem of gastric distress which might otherwise become an obstacle to therapy with the newer steroids prednisone and prednisolone. Each Multiple Compressed Tablet is specifically formulated as a "tablet within a tablet" to provide stability and to release in sequence antacid and anti-inflammatory components.

NEW

'Co-Deltra'

Prednisone Buffered

MULTIPLE COMPRESSED TABLETS

and

'Co-Hydeltra'

Prednisolone Buffered

Supplied: Multiple Compressed Tablets of 'Co-Deltra' and 'Co-Hydeltra', each containing 5 mg. prednisone or prednisolone, 300 mg. of dried aluminum hydroxide gel, U.S.P., and 50 mg. of magnesium trisilicate, U.S.P., bottles of 30 tablets.

SHARP & DOHME
Philadelphia 1, Pa.
DIVISION OF MERCK & CO., INC.

'Co-Deltra' and 'Co-Hydeltra' are the trademarks of MERCK & CO., INC.

HELP FOR PROBLEM DRINKERS *

* The Problem Drinker is one whose drinking causes a continuing and growing problem in any department of his life.

IF YOU HAVE PATIENTS IN THIS CATEGORY . . . . INVESTIGATE!

Hazelden is a non-profit organization, designed to help problem drinkers return to normal living. Its peaceful country setting is on beautiful Lake Chisago, near Center City, 45 miles northeast of the Twin Cities, with spacious grounds, suitable and well-equipped buildings. Hazelden is secluded, yet within easy reach of U. S. Highway 8.

Your Inspection Is Invited.
Complete Information on Request.

Director
LYNN CARROLL

Affiliated with St. Croix Memorial Hospital
MEDICAL STAFF
Fred B. Reigel, M.D., *Chief of Staff*
J. C. Belshe, M.D., *Asst. Chief of Staff*
Norwood E. Wegner, M.D.

Hazelden

Twin Cities Office
341 North Dale Street - Saint Paul, Minn.

24 Hour Telephone—CApital 7-6397

Brown & Day, Inc.

cordially invite you to

VISIT BOOTHS 61 & 82

at the

Minnesota State Medical Meeting

Rochester, May 21, 22, and 23

as well as

BOOTHS 27 & 29

in the

Upper Midwest Hospital Conference

Minneapolis Auditorium

May 23, 24 and 25

—

We will be looking forward to seeing you!

for fast service call CA 2-1845

SERVICE BROWN & DAY INC SAINT PAUL USA QUALITY

62-64 EAST 5TH ST
St. Paul 1, Minn.

Cook County Graduate School of Medicine

INTENSIVE POSTGRADUATE COURSES

STARTING DATES—SPRING & SUMMER 1956

SURGERY—Surgical Technique, two weeks, June 4, July 23
Surgical Anatomy and Clinical Surgery, two weeks, June 18
Surgery of Colon and Rectum, one week, June 18
General Surgery, two weeks, September 10
Thoracic Surgery, one week, June 4
Esophageal Surgery, one week, June 11
Breast and Thyroid Surgery, one week, June 18
Gallbladder Surgery, ten hours, June 25
Fractures and Traumatic Surgery, two weeks, June 18
Varicose Veins, ten hours, June 18

GYNECOLOGY—Office and Operative Gynecology, two weeks, June 18
Vaginal Approach to Pelvic Surgery, one week, June 11

MEDICINE—Electrocardiography and Heart Disease, two-week basic course, July 9
Gastroscopy and Gastroenterology, two weeks, September 10

RADIOLOGY—Diagnostic X-ray, two weeks, September 17
Clinical X-ray, two weeks, by appointment

PEDIATRICS—Neurological Diseases: Cerebral Palsy, two weeks, June 18

UROLOGY—Two-week Course, October 8
Cystoscopy, ten days, by appointment

TEACHING FACULTY—ATTENDING STAFF OF COOK COUNTY HOSPITAL

ADDRESS: REGISTRAR, 707 South Wood Street, Chicago 12, Illinois your patient should not be endangered by fluid accumulation during "rest periods"

YOUR PATIENT NEEDS AN ORGANOMERCURIAL

When a diuretic must evoke acidosis to be effective, continued administration without dosage limitation results in refractoriness. Other diuretics may require interrupted dosage to avoid gastrointestinal irritation.

But the sustained diuresis achieved by the organomercurials never necessitates routine "rest periods" because of their mode of action.

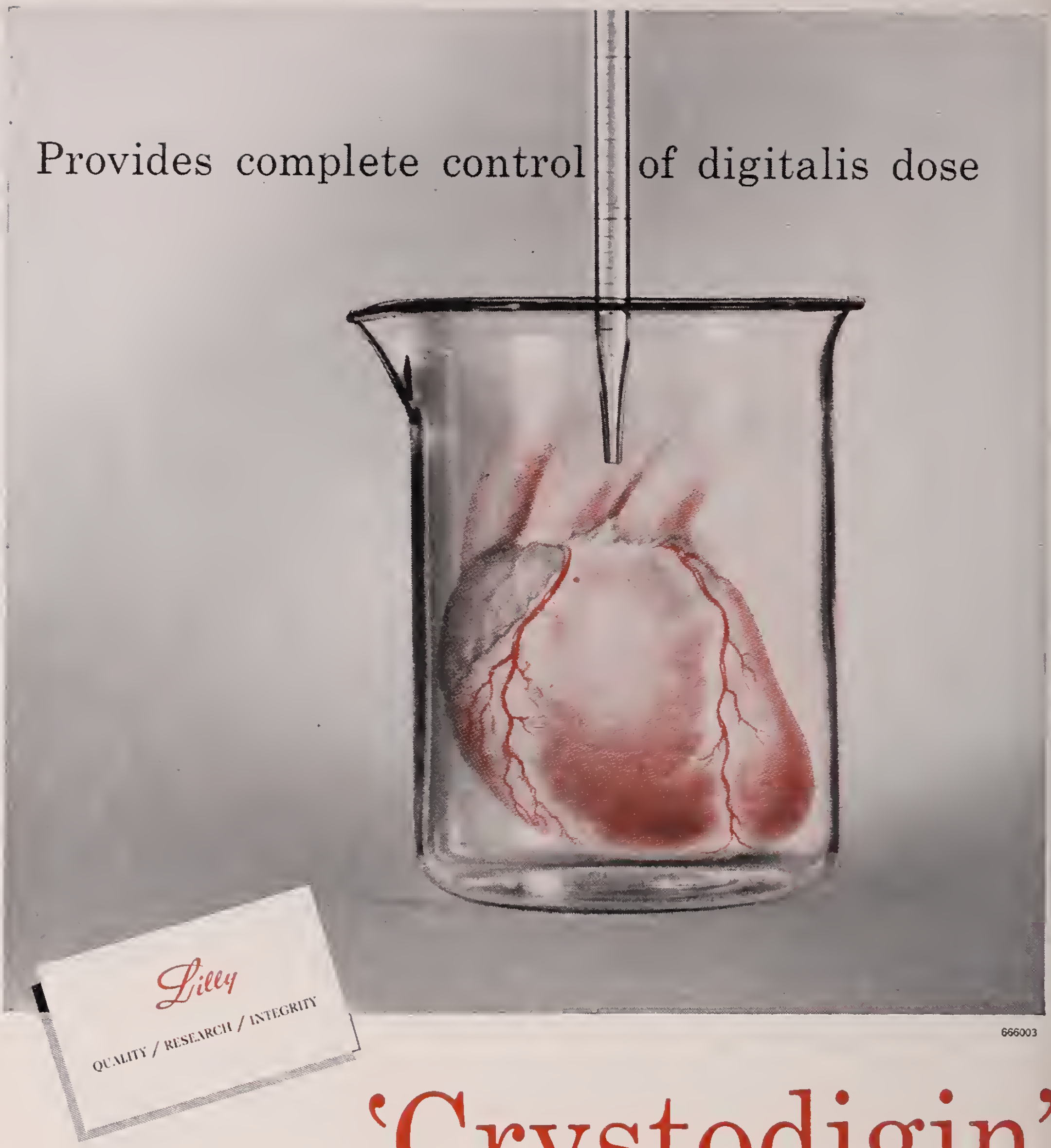
TABLET **NEOHYDRIN**®

BRAND OF CHLORMERODRIN (18.3 MG. OF 3-CHLOROMERCURI-2-METHOXY-PROPYLUREA EQUIVALENT TO 10 MG. OF NON-IONIC MERCURY IN EACH TABLET)

a standard for initial control of severe failure **MERCUHYDRIN® SODIUM**
BRAND OF MERALLURIDE INJECTION

01256

LAKESIDE



Provides complete control of digitalis dose

'Crystodigin'

(CRYSTALLINE DIGITOXIN, LILLY)

. . . . permits accurate dosage titration to produce the maximum therapeutic effect

Since initial digitalization and maintenance dosage must be carefully individualized, 'Crystodigin' fulfills the important requirements of a preferred digitalis. 'Crystodigin' is a crystalline-pure, uniformly potent single glycoside that is completely absorbed in the gastro-intestinal tract. With 'Crystodigin,' the maximum therapeutic effect can be safely determined by dosage titration in increments as small as 0.025 mg.

Available in scored tablets of 0.05 mg. (orange), 0.1 mg. (pink), 0.15 mg. (yellow), and 0.2 mg. (white); and in 1-cc. and 10-cc. ampoules, 0.2 mg. per cc.

ELI LILLY AND COMPANY • INDIANAPOLIS 6, INDIANA, U.S.A.

80TH ANNIVERSARY 1876 • 1956

Original Contributions

Obstruction of the Alimentary Tract
n the Neonatal Period

GEORGE A. HALLENBECK, M.D.
Rochester, Minnesota

OBSTRUCTION of the alimentary canal in the first four weeks of life is rare enough be forgotten easily but common enough to be rt of the experience of almost any physician hose practice includes treatment of babies. ometimes, as in babies who have atresia of some rt of the gastrointestinal tract, the presence of ostruction requiring surgical treatment is obvious on after birth. On other occasions, the presnce of vomiting and abdominal distention in the osence of complete obstruction can make it ifficult to decide whether or not an operation is ndicated. Newborn infants are well able to tolrate even extensive operative procedures on the astrointestinal tract if such operations are perormed when the children have the proper balance f fluid and electrolytes and before they have beome depleted by starvation. Undue delay in ecessary surgical intervention leads to higher oprative mortality rates. Accurate and prompt preperative diagnosis presupposes a working knowldge of the entities likely to produce obstruction n children in this age group, just as adequate surical treatment demands the ability to recognize he various lesions at the operating table and to pply appropriate treatment.

The purpose of this presentation is to discuss roadly the usual causes of obstruction of the limentary tract in the neonatal period and to ndicate the operative remedies that have been ound most effective for each. A list of entities nost likely to be encountered is presented in Table I nd will serve as a framework for the discussion. The first four conditions listed permit accurate diagnosis and the surgeon ordinarily knows the cause of obstruction before operation. The exact diagnosis in the remaining conditions may be suspected or even fairly certain but it is often impossible to make it preoperatively.

TABLE I. COMMONER CAUSES OF OBSTRUCTION OF THE ALIMENTARY TRACT IN NEWBORNS

Atresia of the esophagus
Hypertrophic pyloric stenosis
Malformations of the anus
Incarcerated hernia (inguinal or diaphragmatic)
Atresia or stenosis of the intestine
Incomplete rotation of the midgut
Meconium ileus
Duplications of the intestinal tract
Obstruction associated with Meckel's diverticulum
Annular pancreas
Aganglionic disease of the colon

Atresia of the Esophagus

Atresia of the esophagus means complete interruption of the lumen of the gullet, an anomaly that rarely occurs alone, usually being encountered in conjunction with a fistula between the esophagus and the trachea. The upper segment of the esophagus ends blindly and the lower end communicates with the trachea in more than 90 per cent of cases. In the few remaining cases, either the upper segment or both segments join the trachea. In the common variety, air from the trachea has ready access to the intestines, which promptly acquire the normal gas pattern visible on roentgenologic examination. What is more important, gastric contents and spilled-over saliva are prone to enter the respiratory tract, where they cause pneumonitis. It is of great importance that the diagnosis be made early so operation can be performed before widespread pneumonitis increases the risk to the patient.

The two signs that should make one think of possible atresia of the esophagus are excessive salivation and apparent inability to swallow. Salivation is almost continuous. Although babies so

---

Read at the meeting of the Southern Minnesota Medical Association, Albert Lea, Minnesota, September 12, 1955.

From the Section of Surgery, Mayo Clinic and Mayo Foundation, Rochester, Minnesota. The Mayo Foundation is a part of the Graduate School of the University of Minnesota.

affected usually try to eat, swallowing is followed by coughing and cyanosis. Faced with this situation, the physician should try to pass a small rubber catheter into the esophagus. If its progress is blocked in the upper part of the thorax, esophageal atresia may be present. A few drops of iodized oil injected into the catheter before a roentgenogram is made will delineate the blind end of esophagus and usually will demonstrate the absence of a fistula between this blind end and the trachea. If the roentgenogram also shows air in the intestines, as it usually does, the presence of a fistula between the trachea and the lower end of the esophagus is established (Fig. 1). Use of excessive amounts of iodized oil is to be avoided.

If untreated, children who have this disorder die in a week or so of pneumonia and starvation. The earlier the diagnosis is made, the better is the child's condition likely to be and the better are his chances to survive operation.

Once the diagnosis is made, the baby should be placed in a semisitting position with suction applied continuously to the esophagus to minimize the chance for secretions to enter the lungs; antibiotics should be administered, oxygen should be provided by means of a tent or incubator and an attendant should be constantly present to clear the mouth of secretions, should they accumulate. If the diagnosis has been made late, time may be required for the pneumonitis to improve and for hydration by intravenous injection of fluids.

In the earliest era of surgical treatment, successes were few and far between and followed an interminable and expensive series of operations in which the gullet was exteriorized in the neck, the tracheo-esophageal fistula closed, gastrostomy performed and a subcutaneous channel constructed between the esophagus and stomach. This cumbersome method has been abandoned in all but a few unusual cases in favor of one-stage closure of the fistula and end-to-end anastomosis of the esophagus performed as soon as possible after birth. At the present time, a survival rate of 50 per cent appears acceptable, although better results have been reported.[1] Haight,[2] who was instrumental in introducing the one-stage operation for tracheo-esophageal fistula, recently reported recovery in ninety-four (58.7 per cent) of 160 patients operated on between 1939 and 1955. Fifty-one (67.1 per cent) of seventy-six patients operated on during the last five years recovered. Seven died later, leaving forty-four (57.8 per cent) of the original group living. Survivors do exceedingly well. Perhaps a third will need occasional dilatation of the esophagus during the first year or so of life.

Hypertrophic Pyloric Stenosis

Hypertrophic pyloric stenosis, the most frequently occurring lesion on this list, is the familiar obstructing hypertrophy of the muscle in the pyloric region; it is commoner in boys than in girls. Vomiting seldom occurs before the tenth day of life and the vomitus virtually never contains bile; these facts are of great aid in differentiating pyloric stenosis from atresia and pronounced stenosis of the intestine, in which vomiting is present soon after birth, and from other causes of obstruction distal to the ampulla of Vater, in which vomitus containing bile is regularly present. Presence of visible peristaltic waves passing from left to right across the upper part of the abdomen after feeding is typical. With persistence, the pyloric tumors usually can be palpated. The Ramstedt operation of pyloromyotomy, in which the serosa and muscularis on the anterior aspect of the pyloric tumor are incised longitudinally to allow the underlying mucosa to bulge into the defect, carries a postoperative mortality rate of less than 1 per cent and gives results that are among the best in the realm of surgical treatment.

Malformations of the Anus

The embryo passes through a period in which the urogenital tract and the intestine share a common cloaca separated from the exterior by a cloacal membrane. The genitourinary system and the rectum normally become separated completely and the rectum gains its normal opening in the perineum. Arrest of this process can produce a variety of malformations estimated to occur once in 5,000 births. The classification of imperforate anus of Ladd and Gross[3] is useful in organizing these disorders. This distinguishes four main types as follows: Type 1, stenosis at the anus (6 per cent); Type 2, membrane obstructing anus (3 per cent); Type 3, imperforate anus with rectum ending above it (87 per cent) and Type 4, normal anus with rectal pouch ending blindly above it (4 per cent).

In about 70 per cent of cases, the anomalies have associated fistulas connecting the rectum with the urinary tract, vagina or perineum. Such fistulas occur in about 15 per cent of Type 1 and

Type 2 abnormalities and in about 80 per cent of Type 3 malformations. In males, the fistulas are ectovesical, rectourethral or rectoperineal. In emales, the fistulas are between the rectum and he vagina, or the rectum and the perineum.

The Type 1 anomaly, anal stenosis, is usually reated best by dilatation, although anoplasty occaionally may be necessary.

The Type 2 anomaly is treated by incising or xcising the obstructing anal membrane, keeping he anus patent by dilatation afterwards.

The Type 4 anomaly sometimes can be treated by incision per rectum followed by dilatation if he upper segment is near enough to the lower one. In other cases, an abdominoperineal operaion with anastomosis performed perineally after Swenson's technique is the preferable definitive operation; temporary colostomy may be the best way to tide the infant over the first nine months or year of life.

Some Type 3 anomalies can be treated by means of a perineal approach, whereas others require a combined abdominoperineal operation. In general, if the rectal pouch is within 1.5 cm. of the perineal skin or if a rectoperineal or low rectovaginal fistula is present, repair from the perineal approach is possible and should be done as a primary procedure. In the other cases, one either can perform colostomy and defer the definitive operation or can carry out the abdominoperineal pull-through procedure at birth. The one-stage procedure is probably preferable when good anesthesia for newborn infants is available, when the surgeon's experience in both the technical details of such operations and the rather exacting postoperative care justifies it, and when the baby is lusty, weighs more than 6 pounds and has no other serious anomalies to increase the risk. Any fistulas with the vagina or the urinary tract are disconnected at this time. Colostomy is still a good operation when circumstances justify it. Use of the transverse colon leaves the sigmoid free for later use but probably is followed more frequently by prolapse than is sigmoid colostomy. The latter is satisfactory if it is done as near the descending colon as possible.

Incarcerated Hernia

Incarcerated inguinal hernia needs no explanation. Its presence should be obvious if it is sought. Treatment, if attempts at reduction fail, consists of surgical reduction and repair of the hernia. If the hernia can be reduced, often with the aid of sedation, it is advantageous to allow a day or so to pass before repair is attempted, since the edema of the sac that regularly accompanies incarceration makes the tissues friable and somewhat more difficult to handle than is the case when repair is elective.

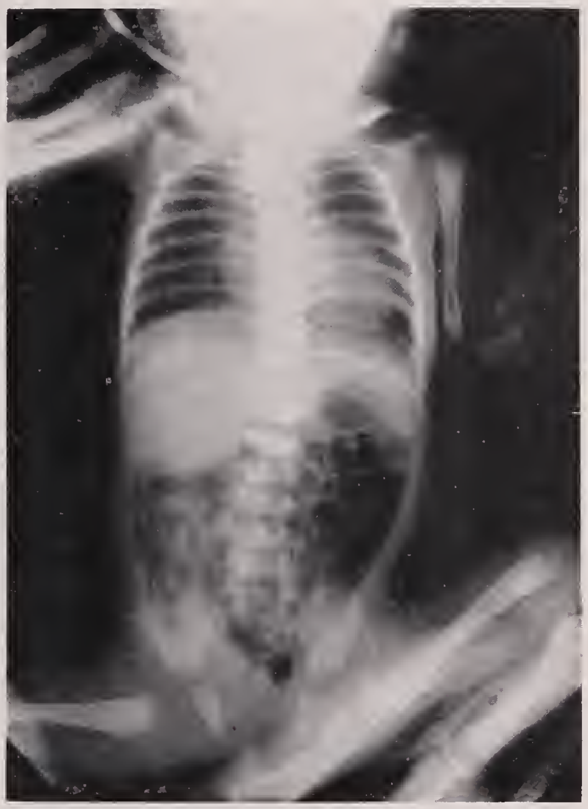


Fig. 1. Plain roentgenogram from a newborn infant with atresia of the esophagus and a tracheo-esophageal fistula. The catheter and iodized oil delineate the blind end of the upper portion of the esophagus. The presence of air in the intestine proves that the lower end of the esophagus communicates with the respiratory tree.

Congenital diaphragmatic hernias, usually through the posterolateral portion of the diaphragm, may allow varying portions of the liver, spleen, stomach, small intestine and colon to migrate into the right or left thoracic cavity. Vomiting caused by obstruction may be present, although cyanosis and dyspnea due to compression of a lung are often more prominent findings. The diagnosis can be made readily by plain roentgenograms, which show evidence of abdominal viscera in the thorax. Surgical repair of the hernial opening should be carried out through an abdominal approach as soon as possible.

Less Obvious Causes of Obstruction

Once patency of the esophagus and anal canal is demonstrated and the presence of pyloric stenosis and hernias is excluded, one can assume that the newborn child who vomits either has a feeding problem that may respond to changes in the formula or has one of the other types of organc obstruction listed in the table. The task of differentiating infants for whom laparotomy is indicated from those for whom medical measures should be employed can be difficult at times, but the severity and unremitting nature of the obstructive symptoms in babies with organic obstruction make the decision to operate clear in most cases. Once the signs and symptoms have suggested intestinal obstruction, plain roentgenograms of the abdomen taken with the child in the upright and supine positions become the mainstay of diagnosis. Although it occasionally may be necessary to introduce barium sulfate into the stomach or colon, use of a contrast medium is unnecessary in most instances. Characteristics of these roentgenograms will be mentioned as the various lesions are discussed.

Atresia or Stenosis of the Intestine.—Either atresia, meaning complete loss of continuity, or stenosis may occur in any part of the small intestine or colon; multiple sites occasionally are involved. Atresia of the intestine always produces symptoms of obstruction at once; stenosis usually causes symptoms in the first few weeks of life but may be of such modest proportions that trouble does not occur for a year or more. Plain roentgenograms of the abdomen usually will show gas scattered widely throughout the gastrointestinal tract when stenosis is present at some point. If the stenosis is sufficient to produce symptoms of obstruction, dilatation of part of the alimentary canal above the lesion usually is present. In these cases, study by means of barium can be revealing. When atresia is present, gas can go no farther than the atretic segment and, particularly when the atresia is in or above the midjejunum, the roentgenogram can be diagnostic (Figs. 2 and 3).

Treatment is surgical in either of the situations just described. The intestine beyond the site of stenosis is typically large enough that side-to-side anastomosis between it and the dilated intestine above can be done without difficulty. Stenosis of the duodenum below the papilla of Vater is b
handled by duodenojejunostomy, whereas th
above the papilla requires gastroenterostom
When atresia is present, the intestine distal to t
atresia is empty and extremely small, while th
proximal to it is hugely distended. Even after t
dilated segment has been decompressed and t
other segment distended with saline, considerab
disparity remains between the sizes of the tw
Because of this, side-to-side anastomosis natura
was favored by most surgeons. Gross[3] noted th
although good results frequently were obtain
when jejunal atresia was treated by this metho
fatality rates for anastomosis in the ileum we
extremely high. He obtained better results
exteriorizing the two blind ends as a doubl
barreled ileostomy, clamping the spur between t
ends later by the old Mikulicz technique and fina
ly closing the ileal stoma. Others[4-7] favor prima
anastomosis with decompression of the proxim
loop of intestine by means of an enterostomy tu
and end-to-end union of the parts despite the di
ference in their sizes.

Incomplete Rotation of the Midgut.—Durin
intra-uterine life, the midgut undergoes rotatio
in a counterclockwise direction, with the superi
mesenteric vessels as its axis. As a result of the
movements, the cecum comes to lie in the rig
lower quadrant of the abdomen and the transvers
colon comes to lie in front of the superior mesenteric vessels and duodenum. Fusion of the root
the mesentery of the small intestine and that
the right portion of the colon to the posteri
body wall follows this process and establishes th
normal anatomic state. This process can be interrupted at any stage. The result sometimes
relatively unimportant, as when the cecum is un
usually mobile, whereas at other times it is productive of intestinal obstruction. The latter ma
or may not be severe enough to cause recognizabl
trouble during the neonatal period.

Obstruction can be caused by either or both
two mechanisms, namely volvulus of the entir
small intestine, made possible by the lack of attachment of its mesentery to the posterior bod
wall, and obstruction of the duodenum caused b
extrinsic pressure applied to it by a band of fibrou
tissue attaching the misplaced cecum to the bod
wall to the right of the duodenum. Described b
Ladd,[8] in 1933, this attachment is often referre
to as Ladd's band. Obstruction caused by incom

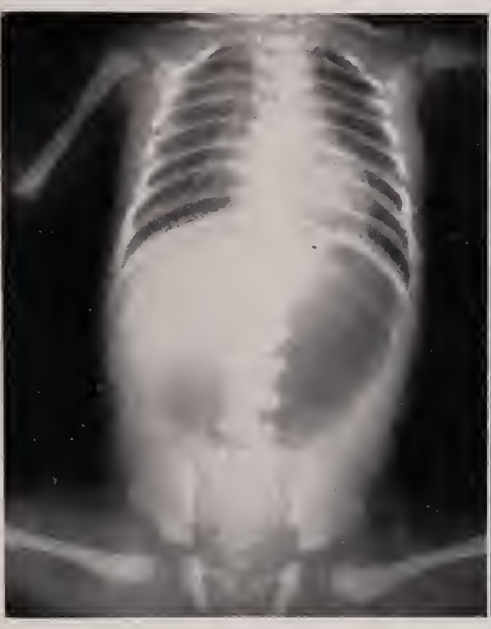


Fig. 2. Plain roentgenogram from a newborn infant with atresia of the duodenum. The gas shadows are limited to the stomach and the first portion of the duodenum.

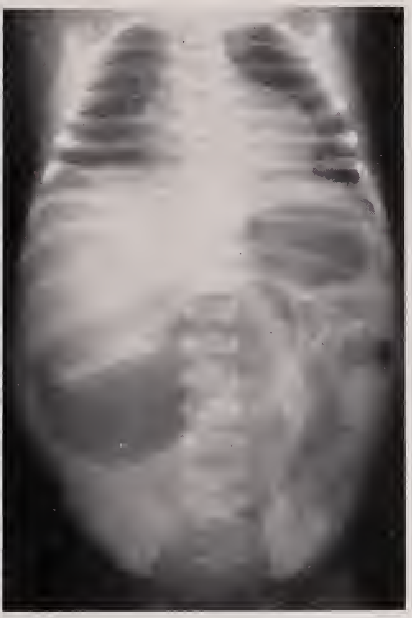


Fig. 3. Plain roentgenogram from a patient with atresia of the jejunum. Gas is evident in the stomach, duodenum and part of the dilated jejunum, but the usual pattern of gas scattered throughout the small intestine is not present.

lete rotation of the gut may appear complete n some instances of volvulus or it may present s incomplete obstruction of the duodenum when add's band is the prominent factor. Roentgeno-ogic examination of the colon and the duodenum with the aid of barium sulfate can be helpul if the symptoms are mild enough that indicaions for surgical intervention are not clear-cut. When it is obvious that an operation is needed, my associates and I choose to spare the infant the tress of these tests.

When the abdomen is opened, one sometimes finds the cecum in the epigastrium or even to the left of the midline and one sometimes finds all the colon hidden by small intestine, which may be of dusky color as the result of volvulus. When this small intestine is delivered from the wound, it is seen to be twisted, usually in a clockwise direction, around its mesentery. The volvulus should be reduced. The picture can be confusing; one must not conclude erroneously that some kind of internal hernia is present and begin fruitless dissection with this in mind. Once the volvulus has been reduced, the cecum and ascending colon in all cases must be freed of attachments on their right and displaced to the left side of the abdominal cavity, thus reproducing an earlier stage of embryologic development. This completely liberates the duodenum. Failure to do this may mean continuation of obstruction. For some reason, recurrence of volvulus is rare.

Meconium Ileus.—This is a form of intestinal obstruction in the newborn in which the terminal portion of the ileum is plugged and obstructed by unbelievably sticky mucilaginous meconium. It is part of a more widespread disorder, including fibrocystic disease of the pancreas and production of extremely thick sticky mucus in the intestinal and respiratory tracts. The great diminution in secretion of digestive enzymes by the pancreas is credited with allowing the meconium to become viscid enough to obstruct the gut. If the child can be tided over this crisis, he will have nutritional difficulties because of poor absorption of food and will have chronic infection of the respiratory tract. In many cases, the former condition can be controlled fairly well by oral administration of pancreatic extracts and the latter by use of antibiotics. Plain roentgenograms of the abdomen in this condition may show a disparity between the size of loops of distended small intestine, associated with the presence of tiny flecks of calcium. Masses sometimes can be palpated in the abdomen.

Perforation of the intestine occasionally has occurred before operation can be performed; perhaps it can happen prenatally. If this is the case, the peritoneal cavity may be obliterated, with dense adhesions causing agglutination of loops of intestine. The outlook in such cases is hopeless. In other cases, the technical problem is one of relieving the obturating obstruction in the terminal part of the ileum. Efforts to remove sticky meconium from the intestine usually fail, although some successes have been reported.[9] Gross[3] has reported better results after removal of the dilated portion of ileum that contains the semisolid meconium by means of the aseptic Mikulicz exteriorization technique already mentioned. The proximal opening serves as the ileal stoma, whereas the distal opening is an orifice into which solutions of enzymes can be perfused to clear the distal part of the ileum and the colon of meconium. The spur is clamped and the opening is closed later.

Duplications of the Alimentary Tract.—These duplications, sometimes called "enterogenous cysts," may occur any place in the alimentary canal. They vary in shape from small or large spherical structures closely attached to the gut to long tubular organs paralleling the intestine. Some are closed, whereas some communicate with the intestine and are, therefore, like diverticula. Obstruction is only one of several ways in which these structures can produce symptoms. When obstruction occurs, it is usually because a tensely filled cyst attached to the gut applies pressure to it. Only twenty of sixty-eight patients reported on by Gross[3] required treatment during the first four weeks of life. Duplications of the intestine are best excised. Usually they are in such close contact with the intestinal tract, sharing its blood supply, that adjacent intestine also must be removed.

Meckel's Diverticulum.—An occasional example of Meckel's diverticulum has a fibrous cord attaching its tip to the navel or to the root of the mesentery. Loops of small intestine can become incarcerated behind or around such a band to become obstructed or even gangrenous. The situation is dealt with as it would be in the adult.

Annular Pancreas.—A rare disturbance in t embryologic development of the pancreas cau a ring of pancreatic tissue to surround the seco portion of the duodenum. This anomaly may asymptomatic, may cause mild obstruction not only in adult life or may produce a high deg of obstruction of the duodenum, requiring tre ment in the neonatal period. Duodenojejunostor gives good results, being preferable to gastroent ostomy and probably to direct attack on the co stricting ring.

Aganglionic Disease of the Colon.—Congen absence of ganglionic cells in Auerbach's plexus the distal part of the colon, the anomaly th causes Hirschsprung's disease, or aganglionic meg colon, and that is always associated with obsti tion in the neonatal period, may produce virtua complete obstruction with diffuse distention of entire small intestine and proximal portion of colon. When gross lesions cannot be found laparotomy for intestinal obstruction in a newbo infant, one must think of this disease. Megacol develops later as a result of obstruction offered the faulty terminal segment of colon and is present at birth. Extramucosal biopsy of the rec sigmoid may provide the diagnosis, since ganglionic cells will be absent in Auerbac plexus between the circular and longitudinal lay of muscle. Often the diagnosis will be presum tive, however, and one is justified in making transverse loop colostomy in such cases, plann to carry out Swenson's operation later.

Summary

A review has been made of pertinent poi concerning the various types of obstruction of alimentary canal likely to be encountered dur the neonatal period. Such information is essen to the physician and surgeon who must diagn these conditions and treat the children so affect The safety factors in the surgical treatment such infants are smaller than they are in adu Experienced anesthesiologists and an understa ing of the management of fluid and electrol balance in infants are essential to success. though disappointments are common and althou multiple and sometimes hidden anomalies ot than the one being treated can thwart succ good results often are achieved and are extrem gratifying.

(References on Page 275)

Treatment of Varicose Veins

A Twenty-five Year Reflection

H. O. MC PHEETERS, M.D.
Minneapolis, Minnesota

TIME, and time alone, will give the best and most conclusive answer to all questions relative t the value of any method of treatment in the fid of medicine. It is the checking up on our rk and end results from year to year that finally mits us to say, with conviction: "This is the best thod of treatment today." After twenty-five rs of treating varicose veins, we can assess our d results and say "This is the best method of ating varicose veins as of today."

Even before the days of Hippocrates, varicose ns were recognized as a cause of pain and dis-ility. Probably no pathological condition has eived more study and effort at correction than s varicose veins. The early efforts were incor-t and held a high mortality rate, and the mod-n era of treatment really dates from the inven-n of the hypodermic syringe by Dr. Pravaz in 54.

The next great step was in 1892 when Trendel-burg[1] recognized and proved the reverse flow of od in the varicose veins by the test that now ars his name. During intervening years efforts r the elimination of the varicose veins have in-ded in the main injection and operative meth-s. First one would be claimed the better and en the other. Each era and cycle would be an provement over the other. The solutions used r the injection treatment were corrosive and structive. In 1908 some countries forbade their e. Study and research have corrected many of e errors, and today we inject varicose veins with punity, and for the selected case it is the ideal ethod.[2,3]

Following the Trendelenburg teachings several stinguished surgeons such as Charles Mayo, Bab-ck, Homans, Mataz and others spent much ef-rt developing operative methods for the removal the varices. Their efforts were attended by high ortality rates due to thromboembolism.

It was Sicard in 1914 and Linser in 1921 that first developed the idea of ambulation following the treatment. Their injection treatments were carried out as outpatient services. It was their improved results in comparison with those following surgery that impelled me to carry on.

TABLE I.

1932 through 1949	5791 Ligations with retrograde injection and follow-up injections.
1950 through October, 1955	5147 Ligations with stripping and follow-up injections.

In 1928 my short term results were so good that I advocated the injection treatment of all cases of varicose veins.[4] As time went by I realized my error after seeing many moderate cases and almost all of the severe cases recurring. Still these efforts and successes were an improvement over anything done before. My sixty-fifth case died of a pulmonary embolus but the pathologist who did the autopsy decided the embolus most probably came from a pelvic infection which she had at the time.

During this same time surgeons were correcting their errors and doing better work with the consequent reduction of pulmonary emboli.

The next forward step was a combination of the two methods of treatment, doing a ligation of the veins in cases of proven reverse flow, and the use of the injections to obliterate the veins below.[5,6] It was only after years of work that surgeons realized that the best end results were achieved with the ligation high *"above"* all tributaries and flush with the wall of the femoral vein at the saphenofemoral junction.

John Homans[7] was the first surgeon to emphasize this particular bit of technique. To him we must give credit for laying the foundation for our present-day success. Numerous papers were written on the subject of the *new* and *modern* treatment of varicose veins by doing the high saphenofemoral ligation followed either immediately or later with injection of the distal segments.[5,8] Sev-

---

Presented before the Hollywood Academy of Medicine, ollywood, California, September 9, 1954.

eral movies[9] were made to show the detailed technique, and we thought we had reached the ultimate in the treatment of varicose veins.

During the period of 1945 to 1947 I tried to assess my results, not in periods of months, but of years. Even though we had tried to do the best surgery we could with careful follow-up injections in all cases, we often found complete failure with the ligation and retrograde injection treatment of varicose veins. They often recanalized and became as large as when first seen.

Further study of these cases would often show a good sapheno-femoral ligation with the proximal stump closed but with the percussion pulse (P.P.T.) felt through the lower thigh and disappearing in the mid or upper thigh. The multiple tourniquet test would show that the reverse flow came from the mid or upper thigh but not from the groin. In many cases we found the reverse flow was from a perforator vein in the lower leg. We then started picking up the recanalized vein internal to the knee and passing the stripper upward. To our surprise we found it would often pass up to the fibrosed segments just below the main scar at the groin. The stripping of this segment upward would often reveal a perforator or communicating vein in the mid or upper thigh. In passing the stripper downward we found many perforator veins in the lower leg as a cause of recanalization.[10] This stimulated greater study to locate the perforator or communicating veins before any surgery was done, and we found that with more careful examination the incompetent perforator veins could usually be located and marked before the primary operation was done.[11] This combination of a careful preoperative examination and study of each individual case followed by "adequate" surgery for the case at hand and then the use of injection treatment for the scattered and remaining small, tortuous, varicose segments, has produced a good and lasting result in practically all cases.

"Adequate" surgery, mentioned above, refers to a ligation flush with the femoral vein above all tributaries, followed by stripping and dissection of all the main varicosed segments below, with injection of all small scattered tortuous segments remaining.[12,13] A simple high ligation by itself, as advocated by some surgeons, has proved to be a failure in so many cases that it can be mentioned only to be condemned.[14]

It must be stated at the outset that we believe that the great majority of varicose veins are be explained by a weakness of the vein wall, permi ting it to dilate and thus render the valves i competent, permitting the reverse flow blood.[15,16] We do see some cases of congenit varicose veins, and instances of congenital arteri venous fistulas occur. In other cases there h been a destruction of the valves in the veins l phlebitis. Any of these factors render the vei more vulnerable to the increase of the intr abdominal pressure associated with work, hea lifting and pregnancy. Moreover, if the wea ness persists, we must expect additional varico veins to form as the years go by. Experien has proven this to be true.[17]

Varicose veins occurring during pregnancy m be an aggravation of pre-existing varicosities, b many cases with rapid formation and develo ment must be explained on some other basis.

There is much evidence in support of t theory that the smooth muscle and connecti tissue of the body loses its tone and relaxes wi pregnancy. The vulvar muscles and pelvic lig ments also relax. Pregnant women often devel a hydro-ureter many times the size of a norm ureter and yet it will rapidly return to norm following delivery. The urological examinati does not reveal evidence of pressure and obstru tion to account for this. Often varicose vei develop rapidly over the thighs and lower le during the second and third month of a pre nancy. At that period of gestation the uteri fundus is not large enough to cause either obstru tion of the ureter or of the venous flow fro the lower extremity.

This can perhaps be best explained on a ho monal basis.[18] The intramuscular administrati of ovarian hormones (Estro Luteum Solutio Lincoln Laboratories) has given marked relief the pressure, pain and fullness in many cases.[19]

The best results are obtained when the hormo therapy is started before the third month a continues through the sixth month. The usu methods of relief, elastic bandages on the low legs with elevation of the lower extremities f twenty minutes three times a day, should be co tinued.

Probably the foremost point in the treatme of varicose veins is the individualization of thera to the particular needs of the patient. Ea patient must be studied separately with a detail history and thorough examination. Venous p ology must be differentiated from arterial pa- ology. Individuals with familial, hereditary vari- se veins must be given a different prognosis than ose with the postphlebitic syndrome. In- viduals with stasis edema must not be classified the same category as those with lymphedema lipedema. Swelling may be due to incompe- nt veins, hypothyroidism or cardiorenal disease. he pain may be due to varicose veins, arthritis, pped disc, or local inflammation. Differential agnosis is just as important in peripheral vas- lar disease as it is elsewhere.

The history of onset is important. Did the ouble come on gradually or rapidly; at what ge; was there an injury, illness or operation about he same time; was a pregnancy involved?

The majority of patients seen by the vascular rgeon are at least middle aged, although the ondition may have been present for several years. his age group can have arterial or venous isease, or both. The typical patient with ar- eriosclerosis gives a history of cold extremities nd claudication; the pain comes on after walking fairly definite distance and disappears within a ew minutes after the patient stops walking. Night ain and ulceration are late manifestations. Ex- mination of the arteriosclerotic lower leg usually eveals a pale, dry skin, often resembling parch- nent. A cold, wet, clammy skin usually indicates asospasm.[21] Rubor, especially of the toes and specially near an infected ingrown toe nail, is ommon. Trophic changes include loss of hair nd ridged nails. The skin temperature is often to 10 degrees below normal. The dorsalis pedis nd posterior tibial pulsations are diminished or bsent and the oscillometric readings are low. There is usually no swelling unless infection is resent or the patient sleeps with the lower leg anging over the edge of the bed for comfort. rterial ulcerations are usually located on the oes, heel or lateral surface of foot and ankle.

Seventy-five per cent of the patients with venous pathology have a familial history of varicose veins and often these patients will describe exacerbations with pregnancy or following a period of inactivity due to injury or illness. The typical findings of enlarged superficial veins, edema and cyanosis easily account for the tired, heavy feeling later in the day. Prolonged standing or sitting causes pain which is relieved by quick calf muscle contractions. Nocturnal leg cramps are a common complaint before surgical treatment. Stasis pigmentation gradually increases as long as the swelling is unchecked. It very slowly fades if good circulation is re-established. Varicose ulcers are usually located on inner lower leg and can be temporarily improved by elastic support, frequent calf muscle contractions and rest periods. Definite treatment requires careful search for, and elimination of, any varicose veins running under or feeding into the ulcer.

Differentiation as to Source of Reverse Flow

Which system is involved—long saphenous or short saphenous, or both?[22] This is determined by percussion pulse transmission (P.P.T.) and the Trendelenburg test. These two tests form the basis for any good examination and give information obtainable in no other way. The P.P.T. helps us chart the course of the veins. The Trendelenburg test helps locate the origin and determines the amount of leakage. Not infrequently the reverse flow originates in the long saphenous but, because of communicating vessels, the short saphenous veins are enlarged, and vice versa.

Often one or more incompetent perforator veins allow reverse flow into and cause dilatation of, the long or short saphenous system. Good therapy requires ligation of the perforator vein and closure of the defect in the fascia. The perforator veins should be diligently searched for and their location carefully marked *before* surgery.[11,12] They can be felt as true openings, in the fascia. Finger tip pressure in these soft spots or holes is painful, as is the stretching of any opening in the deep fascia. Perforator veins are most commonly found on the internal surface, mid and lower thirds of lower leg. They may occasionally be located below the internal malleolus and feed upward into an ulcer, keeping it open. They may sometimes be felt in the base of a healed ulcer or dermatitis area and may be the cause of frequent recurrences. The Trendelenburg test helps to locate these perforators. If the veins below the tourniquet fill in ten seconds, you can be sure that one or more incompetent perforator veins are present.

Treatment of Varicose Veins

Preoperative.—General measures: Eliminate active infection including that due to fungus; encourage habit of frequent calf muscle contraction; reduce obesity; correct systemic conditions such as anemia, hypothyroidism, et cetera.

The very obese patient with varicose veins on the thighs and lower legs will usually have a poor end result. As a rule new varicose veins will form within a few months and they are hard to find and inject well in the obese leg. Such patients are also more liable to develop swelling and edema following radical dissection and stripping.

Surgical.—(1) Large varicose veins with definite reverse flow must be ligated *wherever* the reverse flow begins; the distal segment must be removed by stripping and dissection wherever possible.[8] Perforator veins must be carefully sought, dissected out and ligated.

Ligation at the source, plus retrograde injections of the distal segment, is satisfactory only for a superficial, tortuous vein of moderate size such as the lateral femoral cutaneous type, often found on the antero lateral thigh.[5]

(2) Small varicose veins with no reverse flow can be sclerosed by injection therapy.[4,23]

(3) Skin grafting: If the varicose veins have been present for years with the development of severe chronic cellulitis and recurrent ulcer formation, it may be best to do a radical excision of the area down to the deep fascia and the immediate application of a split skin graft. These patients must wear support for "many months" and often for the remainder of their lives.[24,25]

Postoperative — Careful and complete follow up injection therapy of every case should be done at the office one or two months after surgery and then yearly thereafter.

Post-phlebitic patients with deep vein incompetency may not be entirely relieved of their stasis by elimination of the superficial varicose veins.[27,28] For them the "new way of life" as advocated by Luke[14] is imperative. They must not permit the development of edema. Elastic support, rest periods with feet at least on a level with the heart (the sitting position does not correct the edema), frequent calf muscle contractions, et cetera, all help. If necessary a change of occupation is preferable to the damage caused by constant edema.

Most cases of stasis dermatitis improve with good circulation; stubborn, resistant cases often are benefitted by superficial x-ray therapy. They should be referred to a skin specialist. If the case presents the cold, clammy, wet leg showing evidence of vaso spasm being present, then lumbar sympathectomy will often give mu help.[21,22]

Recurring cellulitis: For this condition v must control the edema, give irradiation therap control the fungus infections about the toes ar feet, and give Gantrisin 2 gm. daily for one wee in each month for four to six months.

Then finally the procedure needed to be do is:

(1) The injection method for the early form tions and small veins with no reverse flow.[4,23]

(2) Ligation wherever the reverse flow begi followed with a complete stripping and dissecti in all extensive cases.

(3) Ligation and then retrograde injection the smaller tortuous varicose veins anterior ar external thigh and lower leg.

(4) Ligation, plus stripping, plus blunt di section, plus retrograde injection of extensive to tuous groups of smaller size 1 and 2 veins.[29,30]

(5) Ligation, plus stripping, plus blunt di section, and even the Linton operation.[15] A times an excision of the old cellulitis and ulc area in the lower leg with skin grafting.

(6) Then a careful and complete follow u injection of every case at the office and the yearly thereafter.

(7) When edema has developed with seconda complications of cellulitis and ulcerations, extern support must be used to control the swelling. Th patient must learn "a new way of life."[26] Th is best done with a *4-inch elastic bandage* wor very firmly applied from just below the knee dow to and about the ankle and foot. The tight the bandage and the faster the patient walks, th better will be the circulation in the lower leg.

In conclusion this plea is made: A careful hi tory should be taken as to the onset and develo ment of the individual patient's disease. Th should be followed with careful and detailed in spection and palpation examinations, combine with the use of the percussion pulse test, (P.P.T and the Trendelenburg test.

The treatment of the patient then should co sist of an *adequate* surgical procedure, *individua ized* for the given case, together with *adequa* observation and care of the patient the rest his life.

References

Trendelenburg, F.: Ueber die Unterbindung der Vena saphena magna bei Unterschenkelvaricen. Beitr. z. clin. Chir; Tübing., 7:195-210, 1890-91.

Orbach, Egmont: Therapy of varicose veins. Med. Times, 82:826 (Nov.) 1954.

Sigg, K.: The treatment of varicosities and accompanying complications. Angiology, 3:355-370, 1952.

McPheeters, H. O.: The injection treatment of varicose veins. General discussion. Am. J. Surg., 10:19 (Oct.) 1930.

McPheeters, H. O.: Sapheno-femoral ligation with the immediate retrograde injection. Surg., Gynec. & Obst., 81:355 (Oct.) 1945.

Biegeliesen, H. I.: Summary of twenty years work in treating varicose veins. New York J., 5:53 1953.

Homans, John: The operative treatment of varicose veins and ulcers, based upon a classification of these lesions. Surg., Gynec. & Obst., 22:143, 1916.

Summers, John E.: Highlights in the treatment of varicose veins and ulcers. Am. J. Surg., 443, 1953.

McPheeters, H. O.: The modern combined ligation and injection treatment. (Motion picture) Davis and Geck, 1940.

Sherman, B. Stanton: Varicose veins and anatomic findings and operative procedure based upon them. Ann. Surg., 120:772, 1944.

Sherman, B. Stanton: Further findings based on anatomic and surgical dissection. Ann. Surg., vol. 130, 1949.

2. Meyers, T. T.: Exhibit on varicose veins. Scientific Assembly A.M.A. San Francisco, Cal. Jr. Suisse de Medicine (Jan. 13) 1954.

3. Meyers, T. T. and Smith, Lowell: Results of the stripping operation in the treatment of varicose veins. Proc. Staff Meet., Mayo Clin., 29:583 (Nov. 10) 1954.

4. Luke, J. C.: Management of recurrent varicose veins. Angiology, 4:413, 1953.

5. Linton, R. R.: Treatment of peripheral vascular disease. Postgrad. Med., 4:335, 1953.

6. McPheeters, H. O.: The mechanics of the reverse flow of blood in varicose veins as proved by blood pressure readings. Its clinical application to the injection treatment. Surg., Gynec. & Obst., 55:298 (Sept.) 1932.

17. McCausland, A. M.: Influence of hormones upon varicose veins in pregnancy. West. J. Surg., 51: 199-200 (May) 1943.

18. Aguero, O.: Estrogen therapy of varicose veins complicating pregnancy. Rev. Obst. Ginec. Caracas., 6:155-159, 1946.

19. McPheeters, H. O.: The value of estrogen therapy in the treatment of varicose veins complicating pregnancy. Journal-Lancet, 69:2, (Jan.) 1949.

20. Herman, T. G.: The recognition and management of peripheral vascular disorders. Am. Surg., p. 1034 (Oct.) 1954.

21. Ochsner, A.: Treatment of post-phlebitis sequelae. South. M. J., 47:441-447, 1954.

22. Shumacker, Harris B., Jr.; Moor, T. C., and Campbell, J. A.: Functional venography of lower extremities. Year Book of Surgery, p. 236, 1954-55.

23. Alexander, H. A.: Injection therapy of varicose veins using sylnasol foam. Minnesota Med., 36: 1249, 1953.

24. McPheeters, H. O., and Merkert, Chas.: Varicose ulcers: treatment with the rubber sponge or venous heart and supportive bandage. Surg., Gynec. & Obst., 52:1164, 1931.

25. Allenson, G. Rutter: Chronic ulcer of the leg in young subjects. Surg., Gynec. & Obst., 98:291, 1954.

26. Luke, J. C.: Thrombophlebitis, sequelae of. Angiology, 4:413, 1953.

27. Hartman, A. W.: Management of chronic venous occlusion of the lower extremities. Tr. South. S. A., 62:26, 1950.

28. Bauer, Gunnar: Rationale and results of popliteal vein division. Angiology, 6:169 (June) 1955.

29. McPheeters, H. O., and Kusz, Clarence V.: The care and treatment of varicose veins. Am. J. Surg., 88:568 (Oct.) 1954.

30. McPheeters, H. O.: Varicose veins by means of the high ligation and stripping. (Motion picture) Davis and Geck, 1953.

OBSTRUCTION OF THE ALIMENTARY TRACT IN THE NEONATAL PERIOD

(Continued from Page 270)

References

1. Battersby, J. S.: Congenital anomalies of the esophagus. A.M.A. Arch Surg., 71:560-568 (Oct.) 1955.

2. Haight, Cameron: Discussion.[1] A.M.A. Arch Surg., 71:568-569 (Oct.) 1955.

3. Gross, R. E.: The Surgery of Infancy and Childhood: Its Principles and Techniques. Philadelphia: W. B. Saunders Company, 1953, 1,000 pp.

4. Snyder, W. H.; Voskamp, J. R., and Chaffin, L.: Congenital atresia of the ileum; report of five successfully treated cases. West. J. Surg., 58:638-642 (Nov.) 1950.

5. Swenson, Orvar: End-to-end intestinal anastomosis in infants and children. Surgery, 36:192-197, (Aug.) 1954.

6. Gerrish, E. W.: Operative management of congenital intestinal atresia. Ann. Surg., 142:469-475 (Sept.) 1955.

7. Benson, C. D.: Resection and primary anastomosis of the jejunum and ileum in the newborn. Ann. Surg., 142:478-485 (Sept.) 1955.

8. Ladd, W. E.: Congenital obstruction of the small intestine. J.A.M.A., 101:1453-1457 (Nov. 4) 1933.

9. Hiatt, R. B., and Wilson, P. E.: Celiac syndrome. VII. Therapy of meconium ileus; report of eight cases with a review of the literature. Surg., Gynec & Obst., 87:317-327 (Sept.) 1948.

The Position of Radiology in Cardiovascular Diagnosis

FRED JENNER HODGES, M.
Ann Arbor, Michig

WITH the passage of time there are fewer and fewer persons who can relate personal acquaintance and memories with individuals whose work has been memoralized by professorships, scholarships or lectureships. To those so fortunate as to cherish personal memories of Russell Daniel Carman, this occasion becomes considerably more than a simple medical discourse for the remarkable personality of a truly great man reaches across nearly thirty years to pervade their thoughts. A driving, dynamic and brilliant physician, utterly devoted to radiology, it was Carman's great capacity for friendship which all who enjoyed it will remember most fondly.

As the veriest of neophytes in radiology, your speaker came under the spell of that freely extended, sincere and stimulating friendship during visits to the section on radiology at the Mayo Clinic and at medical meetings. Although those contacts were brief, 1923 to 1925, the memory of them has been vivid and deeply inspiring over the years. Carman quickly assumed, and correctly, that instruction was called for and upon every contact poured out by impromptu lecture, precept and vigorous example the clear cut essentials of honest and effective gastrointestinal radiology. The lessons he taught have proved to be increasingly valid for they were fundamental. American radiology has yet to produce an abler performer in this particular field, or a finer, more lovable character. It is particularly fitting that the Minnesota State Medical Association has paid lasting tribute to a former member whose professional accomplishments were of world-wide scope and importance. Let those who did not know him in life accept with confidence the validity of perpetuating his memory by dignifying lectures with his name, for he was truly dedicated to the fin traditions of the profession of medicine.

The position of radiology in cardiovascul diagnosis has been so thoroughly altered since 19 that virtually none of its present features wou be familiar to Carman. In his time it was nece sary for radiologists to content themselves wi measuring the size of the heart, observing its po tion, its shape and the pulsations of its borde and noting the appearance of the great vesse Carman, who was so adept at the exploration the alimentary canal with suspended barium su phate, would be intrigued with today's methods studying the lumen of the circulatory system, ar the interest in surgical techniques and surgic pathology which lured him to the operating tab in following interesting radiologic findings wou find ample opportunity for expansion to the ca diovascular field.

The story of the phenomenal change which h occurred in the radiologic approach to cardi vascular problems in this country differs sharp from the early history of radiology in Americ News of Roentgen's discovery of x-rays, announce in December, 1895, spread throughout the civilize world with electric rapidity and in the Unite States patients were being subjected to x-r diagnosis within a few weeks. The *America X-Ray Journal* was established in 1897, and 1900 the Roentgen Society of the United Stat was organized with sixty-four charter members.

In 1924 Brooks, a surgeon, described a meth of injecting sodium iodide into the femoral arte in order to produce radiologic images of t arterial distribution to the lower extremity. Fe radiologists followed this lead. From 1927 throug out the early thirties, Forsmann in Germany, Eg Moniz and dos Santos and associates in Portug brought forth daring techniques for the radiolog study of opacified blood in the heart, the arteri of the brain and the abdominal aorta and i

---

Carman Memorial Lecture presented at the 102nd Annual Meeting of the Minnesota State Medical Association, Minneapolis, May 23, 1955.

From the Department of Radiology, University of Michigan, Ann Arbor, Michigan.

b nches, but although these methods enjoyed clin- i l recognition in Europe and the Latin American c intries, radiologists of the United States seemed r ictant to employ them.

peripheral capillaries and the chambers of the heart, as well as the entire pulmonary circulation. Radiology has exploited a vast new jurisdiction to add voluminous and intimate knowledge concern-

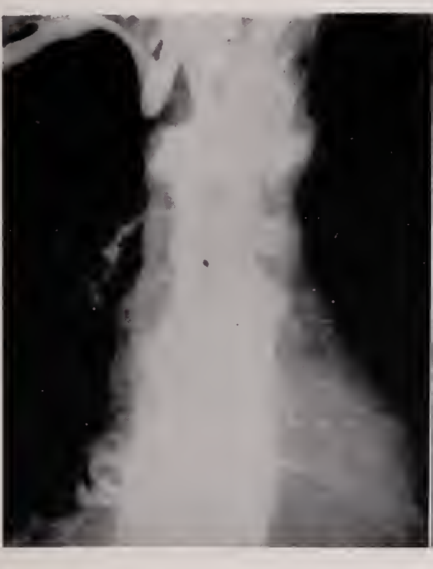


Fig. 1. Complete occlusion of superior vena cava. Injection of opaque material by arm vein fails to result in filling of right atrium.

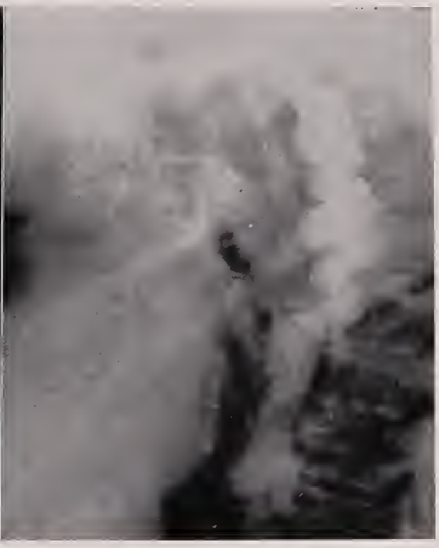


Fig.2. Lateral projection shows extensive filling of tortuous, distended azygos system. Systemic blood from upper extremities must use this route to reach the right heart by way of the inferior vena cava.

It was not until Robb and Steinberg described eir technique and their initial experiences in 39 that angiography began to flourish in Ameri- . An editorial in the *Journal of the American edical Association* of February 15, 1896, offered is admonition regarding x-ray diagnosis: "Its rgical utility in certain ways has probably been fficiently indicated by what has been already one, but enthusiasm as to its future should be mpered by a scientific spirit of moderation that roves all things before building its faith upon em." It would seem that this advice, so blithely nored in 1896, had finally been taken to heart ter a lapse of thirty years, for certainly the new rdiovascular techniques were most carefully rutinized before they finally won widespread ap- roval. Since 1940 the story has been quite dif- rent, for in fifteen years cardiovascular radiology, juvenated by the acquisition of new techniques, as swept forward with accelerating momentum to rilliant clinical accomplishments.

It is now thoroughly feasible and often dramati- ally helpful to visualize the venous system from istal extremities to the right atrium, the arterial ream bed from the origin of the aorta to the ing the morphologic and the physiologic expressions of circulatory disorders. Six basic procedures are used by radiologists in close co-operation with their colleagues in cardiology and surgery: venography, splenoportography, cerebral angiography, retrograde aortography, abdominal aortography and angiocardiography.

Venography

Venography is accomplished by injecting opaque iodine-containing solutions into peripheral veins distal to the point of suspected abnormality. By this means obliterative lesions of many sorts can be demonstrated graphically, as well as the efficacy or incompetency of venous valves in extremity vessels. The procedure which is simple and safe, is often of great utility in identifying the nature of obscure mediastinal lesions (Figs. 1 and 2).

Splenoportography

Splenoportography is employed for the study of the splenic vein and the portal system. Opaque material is introduced by direct percutaneous needle puncture into the splenic pulp, following which several exposures of the upper abdomen are made at intervals of about one second. Under normal conditions the splenic vein fills rapidly, discharging freely into the portal vein and its intrahepatic subdivisions. Within a few seconds the opaque blood fills liver capillaries to the extent that the entire organ becomes visibly opaque. The tributaries emptying into the splenic and portal veins do not fill. When portal hypertension exists, either intra- or extrahepatic in type, findings on x-ray are distinctive and of reliable diagnostic value. The tributary veins now serve as collateral escape routes for blood unable to pass through the normal liver route, and varices of tl stomach and esophagus are dramatically show When abnormal masses occupy the liver they ca be recognized as defects in the hepatogram (Fig 3 and 4). and certain lesions of the pancreas ca be apprehended by the visible alterations pro duced in the course and contour of the splen vein.

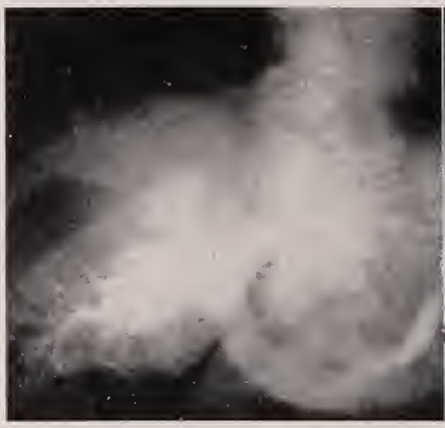


Fig. 3. Early phase of splenoportogram shows absence of portal venous elements in entire upper portion of right lobe of liver.

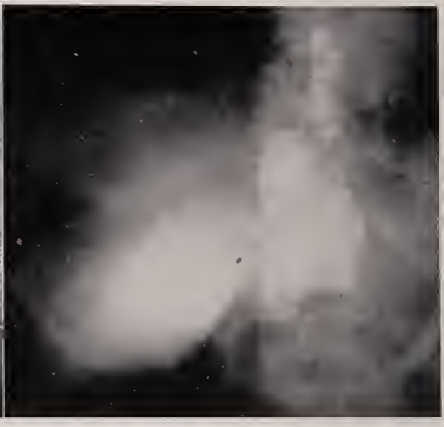


Fig. 4. Later phase, same patient. Lower portion of liver now opacified; upper portion not opacified. At autopsy very extensive replacement of liver by metastatic carcinoma from primary sigmoid lesion resected five years previously.

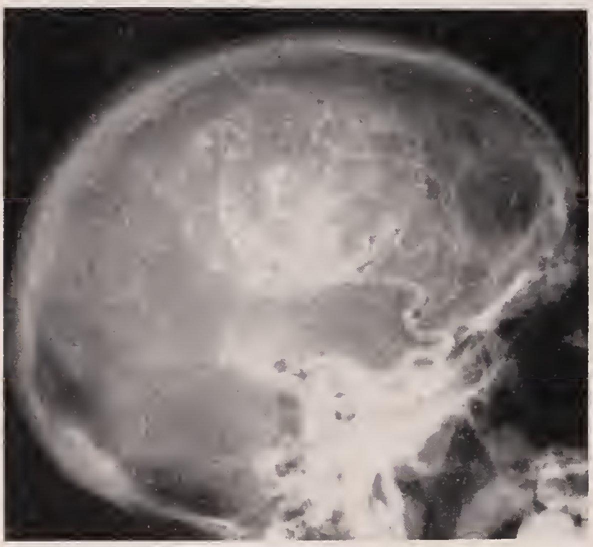


Fig. 5. Large parietal glioblastoma. Displacement of normal vessels. Extreme vascularity of the tumor itself is well shown.

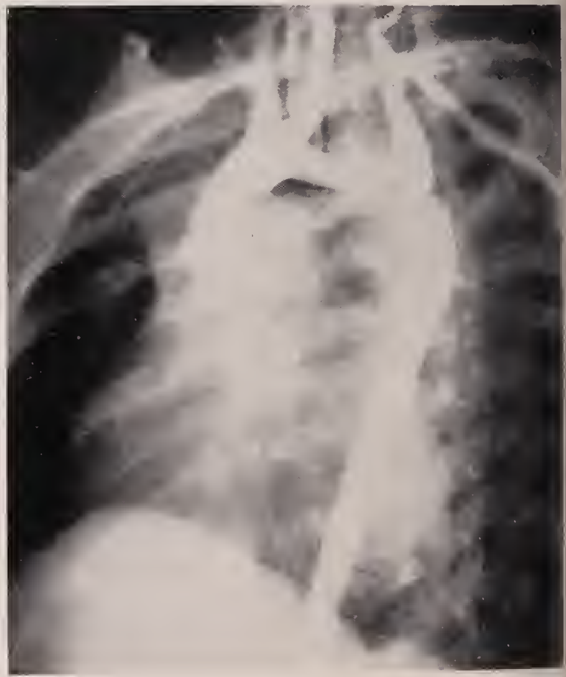


Fig. 6. Retrograde injection of subclavian artery ou lining aortic arch and major branches. Mild degr of coarctation seen at origin of descending aorta a broad, patent ductus arteriosus.

Cerebral Angiography

Cerebral angiography, the radiologic recording intracranial vessels, is accomplished by per- sing the internal carotid or the vertebral artery

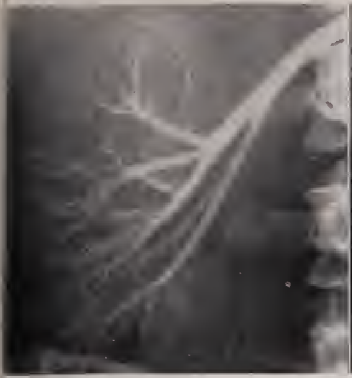


Fig. 7. Selective filling of renal arterial system, right kidney. Needle inadvertently placed in renal artery instead of aorta.

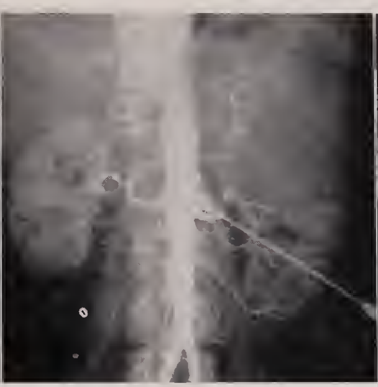


Fig. 8. Abdominal aortogram with normal fill of vessels on right and extensive obliteration of upper pole vessels on left. Large renal carcinoma upper pole left found at operation.

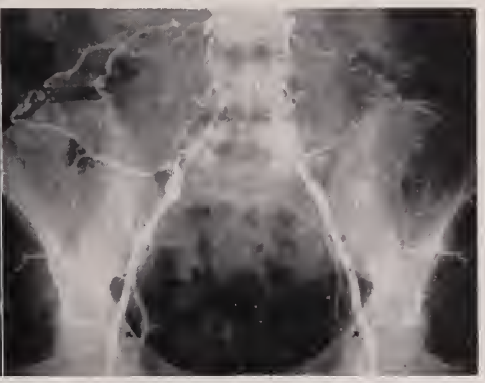


Fig. 9. Abdominal aortogram. Abrupt narrowing of lumen proximal to bifurcation representing prefound atheromatous disease which virtually obliterates lumen of iliac arteries leading to extensive development of collateral arterial channels.

ith opaque material. Ominous as the procedure ounds when first contemplated, this procedure. ntroduced by Egas Moniz, is actually tolerated emarkably well, as well or better than ventriculog- aphy. It is profitable to make x-ray exposures uring the venous as well as the arterial phases of erebral circulation. Using this technique, lesions vhich involve vessels directly as well as those vhich distort and displace vessels can be detected nd localized with remarkable ease and accuracy Fig. 5). In the case of highly vascular tumors ngering opacity within the mass, known as tumor stain," actually renders the tumor visible n its own right. To fully appreciate the status of erebral circulation it is essential to prepare expo- ures in two planes, lateral and frontal.

Retrograde Aortography

To enhance the density of the thoracic aorta nd its branches, the forceful injection of opaque naterial by way of the carotid or subclavian artery gainst aortic pressure is useful and practicable. This procedure is helpful in the demonstration of oarctation of the aorta, aneurysms of aorta or najor branches, anomalous vessels which may be roducing undesirable symptoms (Fig. 6) and for etter understanding of the nature of pulmonary or mediastinal masses lying close to the aortic rch.

Abdominal Aortography

Dos Santos in Portugal was the first to opacify the abdominal aorta by direct percutaneous puncture below the diaphragm and above the renal arteries. This procedure produces a wealth of radiographic evidence concerning intra-abdominal lesions. It is possible not only to recognize intracapsular renal masses but to differentiate in many instances between benign and malignant tumors on the basis of vascular pattern (Figs. 7 and 8). In Sweden clever techniques involving the placement of catheters introduced through the femoral artery directly into individual renal arteries have been successfully employed together with steroscopic filming. It is possible by aortography to visualize the major divisions of the aorta almost at will, and to provide detailed information concerning obliterative lesions of the arteries which supply the lower extremities (Fig. 9). Such information, supplied to the surgeon, often leads to spectacular alleviation of serious inadequacies of circulation for the removal of obstructing atheromatous masses or grafting operations can be planned and executed with great accuracy.

Again in Sweden, catheterization of the iliac artery by way of the femoral, using externally applied pressure to partially occlude the aorta and the femorals, is used to produce lingering opacification of the uterine artery on one or both sides. By this means Fernström is able to demonstrate placental sinuses in the early weeks of gestation. The method is particularly useful in establishing the diagnosis of tubal pregnancy and in localizing

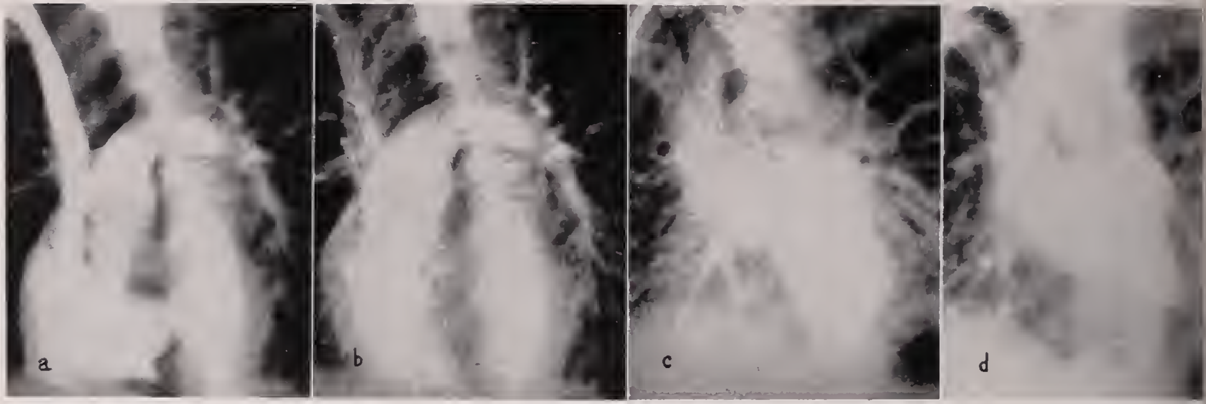


Fig. 10.—Venous angiocardiogram.

(a) Fill of superior vena cava, right heart and pulmonary arteries. (b) One second later right ventricle in diastole shows location of interventricular septum with no filling on left.

(c) Four seconds later opacified blood returning by way of pulmonary veins outlines the left atrium and ventricle. The aorta is beginning to fill. (d) The l ventricle is shown in systole one second later. T arch of the aorta with innominate, left common carot but no left subclavian artery are clearly shown. Loc ized narrowing of the descending aorta (coarctation c be recognized with post-stenotic dilatation.

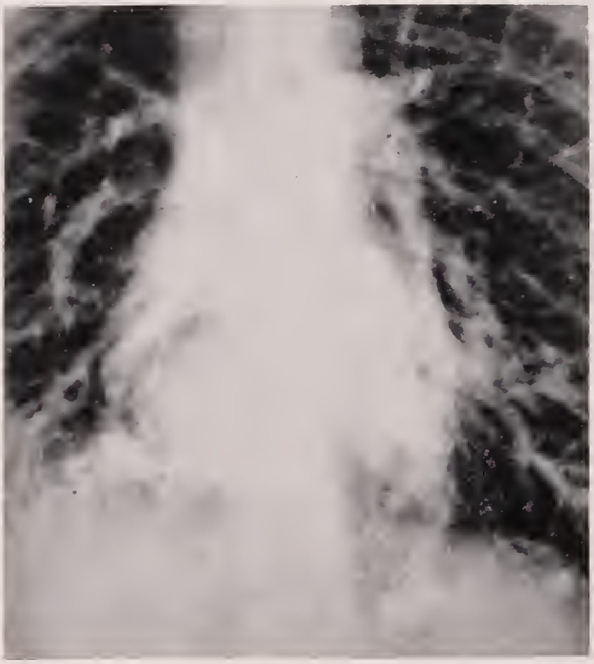


Fig. 11. Venous angiocardiogram showing several pulmonary arteriovenous aneurysms. The largest communication is to be seen below the diaphragm contour on the left. Although the exposure was made only a few seconds after injection the left auricle and ventricle are filling prematurely as the result of these pulmonary shunts.

the position of the placenta in normal intrauterine pregnancy.

Angiocardiography

The radiologic procedure most extensively used in cardiovascular diagnosis is angiocardiography. This can be done by the venous route or by selective injection through catheters. When injection made through the antecubital vein, all chambe and vessels from the vena cava to and includi the aorta are successively opacified. Exposures short time intervals serve to record importa events of the central circulation (Fig. 10). A wi variety of congenital malformations yield distin tive radiologic evidence of their presence ar character. The method is of great value in dete mining which patients with congenital heart d ease may hope to benefit by surgical treatme Not infrequently the surgeon can determine advance what difficulties he may expect to e counter. Tetralogy of Fallot, transposition of gre vessels, septal defects, infundibular and valvul pulmonic stenosis and patent ductus arterios lend themselves well to this method of exact dia nosis.

When properly employed in conjunction wi accurate cardiac catheterization utilizing pressu determinations, oxygen concentrations, simult neous electrocardiography and electrokymograph angiocardiography reaches its peak of diagnost accuracy. Specialized radiographic equipment essential, preferably designed to produce extreme brief, closely spaced exposures in two planes simu taneously.

Angiocardiography is also useful over and b yond the study of central circulatory abnormaliti It is gratifying to be able to provide unmistakat

(Continued on Page 300)

hronic Pyuria

iagnostic and Therapeutic Measures

C. D. CREEVY, M.D.
Minneapolis, Minnesota

HIS discussion is concerned, not with those mild acute infections of the urinary tract which appear completely with sulfonamides and forced ids, and never return, but rather with those ich become chronic or recur repeatedly. Failure simple therapy suggests that some factor is pro- ting the offending organism against the agents d, and demands a search for that factor before munization against all the potent antibiotics has curred. Only if this is done can crippling dam- e to the urinary tract be avoided in the majority instances. The neglected patient may suffer from urrent and disabling attacks of chills, fever, and sical irritation, or may lose a kidney from onephrosis; hypertension may result from uni- teral or bilateral cicatricial pyelonephritis; the tter may lead to death in uremia. Lithiasis may company a resistant infection with urea splitters, rticularly if urinary stasis is present.

The steps in the necessary investigation are well iown. In the female, the diagnosis of urinary fection cannot be made unless the urine is se- ired with a catheter; otherwise, a long and futile urse of chemotherapy may be directed against a uria which is actually vaginal in origin. In the ale, the starting point should be the two glass st. While this is indicative rather than conclu- e, a cloudy first glass with the second one clear ints directly to the urethra or prostate as the use of the pyuria. The prostate should always be assaged and the freshly expressed fluid examined der a cover slip for pus. While it is not very ten the source of a pronounced pyuria, the pos- bility should not be overlooked. If one finds areas tender induration in the gland, the possibility of ute prostatitis must be considered; this is a fairly mmon cause of recurrent dysuria and increased equency in the male. If the patient is examined tween attacks, the gland may feel normal, so that it may be necessary to have him return for a rectal examination during an acute attack in order to find the tender swelling which points to acute prostatitis as the cause of the symptoms.

The sediment of a centrifuged fresh specimen should be stained by Gram's method because the type of organism found (Gram negative rod or Gram positive coccus) is a rough guide to the selection of the proper antibiotic; and because complete absence of bacteria in the presence of pus suggests the possibility of amicrobic pyuria or of urinary tuberculosis. In this event, the urine should be cultured to make sure that the findings of the Gram stain are valid. One must remember that both the smear and the culture are unreliable if antibiotics have been given within the few days preceding the examination.

The next step is a plain roentgenogram of the urinary tract (KUB). One looks for stones, enlarged, shrunken, or absent renal shadows, for blurring of the margins of the psoas muscles (perinephritic abscess), and for lesions of bone.

The excretory urogram is invaluable as a rough screen for detecting abnormalities of the kidneys ureters, and bladder. Properly made, it will yield a high proportion of definitive diagnoses in surgical diseases of the kidneys and ureters, but is of limited value in recognizing small lesions of the bladder because the relatively large amount of contrast medium which accumulates will mask them. The urogram is particularly useful in urinary infections for estimating the relative functional capacity of the two kidneys; for determining whether suspected calcifications are within the urinary tract; and for detecting stasis and anomalies, i.e., hydronephrosis, vesical diverticula, ureteral duplications, et cetera.

The retrograde cystogram and urethrogram (often combined with advantage) are helpful chiefly when findings up to this point are negative but leave one with the feeling that something has been missed. For example, a radiolucent vesical calculus may produce a filling defect in the cystogram, an unsuspected diverticulum may be seen,

---

From the Division of Urology in the Department of rgery in the Medical School of the University of innesota, Minneapolis, Minnesota.

Presented at the annual meeting of the Northern innesota Medical Association, Bemidji, September, 955.

or a severe chronic prostatitis may appear as small irregular pockets protruding from the prostatic urethra.

No examination of the urinary tract is complete without a cystourethroscopic examination. Many blunders are due to failure to inspect the urethra, thus overlooking the typical fronds of a papillary urethritis in the female, and the dilated ducts with purulent secretion of a chronic prostatitis. Any proliferative lesion of the vesical or urethral mucosa must be subjected to biopsy, lest a small vesical neoplasm be overlooked or misinterpreted as inflammatory. Diverticula of the bladder too small to show in the cystogram (particularly one which is part of an excretory urogram) may be seen; specimens can be collected from each kidney to determine the source of a pyuria not otherwise localized; and retrograde pyelograms can be made when the urogram is unsatisfactory. One should not hesitate to repeat any part of the examination which leaves one with an unsatisfied feeling.

There are many factors which may prevent an infection of the urinary tract from responding to treatment. While these vary widely with age and sex, the principles involved in their recognition and treatment are the same. One should remember that stones and foreign bodies may fail to cause any pain whatever, and attract attention only because they incite and maintain infection. Even ureteral stones producing obstruction of considerable severity may be painless, and prostatic calculi rarely give rise to symptoms other than those of prostatitis. Large or branched renal stones are often painless. Vesical calculi and foreign bodies introduced during masturbation usually produce cystitis and pyuria without any symptoms suggestive of other lesions. For obvious reasons, children and adolescents who have inserted foreign materials into the bladder (chewing gum, paraffine, and candles are favorites) rarely admit it. These facts alone amply justify the employment of urography and cystoscopy in any stubborn infection. The latter is necessary because many calculi and most foreign bodies are radiolucent.

Congenital anomalies which lead to stasis of urine and so protect infecting organisms from therapeutic agents are numerous. Any hydronephrosis which develops gradually is likely to be painless except during bouts of acute infection; even then severe pain is rare. The commonest site of unilateral obstruction is the ureteropelvic junction due to congenital stricture, anomalous vessels, or peripelvic fascia. In the urogram one sees hydr nephrosis with a normal ureter. The horsesho kidney, while uncommon, is often the site of ob struction of this type. Duplications of the rena pelvis and ureter are rather frequently associate with hydronephrosis, usually due to ureteral na rowing. While this may be found at the junctio of the two ureters, it is usually located at the ves cal end of one of them. This may result from stri ture, from abnormal termination of the ureter the urethra or introitus, or from a coincident anomaly, ureterocele. Here the terminal ureter ba loons into the bladder because of a stricture whic involves only the mucosa of the ureteral orific This may obstruct one of a pair of normal urete on the same side or involve a single ureter; it ma overhang the vesical neck to such an extent as cause obstruction there, so that the resulting dilat tion of the upper urinary tract is bilateral.

Other congenital lesions causing urinary stas include vesical diverticula and anomalies produ ing obstruction at the vesical neck. A vesical d verticulum may cause stasis by retaining urin within it, by narrowing an adjoining ureter, or b compressing the prostatic urethra. Other disorde responsible for obstruction at the outlet of th bladder include flaps of mucosa overhanging th internal urinary meatus, congenital valves of th prostatic urethra, hypertrophy of the verumonta num, hypertrophy of the internal sphincter, an congenital absence of the abdominal muscles. In complete emptying of the bladders of infants an young children may also be due to defects o innervation of the bladder and to urethral stri tures and diverticula. Tragically enough, thes lesions are rarely recognized until the upper trac has been damaged beyond repair, simply becaus their possibility is not usually considered. Th situation would be much improved if physicia who take care of children would form the habit watching those with pyuria micturate, and checking the residual urine in every case of chron pyuria. The poor stream is an obvious sign obstruction or a weak detrusor. Only thus ca these serious disorders be discovered in time prevent hopeless deterioration of the kidneys.

Acquired diseases which cause stasis of urine a more frequent in older people. Commonest is pros tatism, whether benign hypertrophy, carcinoma or fibrosis. These foster infection only insofar they prevent emptying of the bladder or lead t the formation of stones. The former situation cognized readily by measuring the residual urine, d the latter by roentenograms of the bladder and cystoscopic examination. Next in frequency are obably urethral strictures. It is unfortunate that e striking reduction in the frequency of post-norrheal strictures which has accompanied the e of penicillin should be to some extent neu-lized by the increase of the traumatic variety e to accidents with the automobile and airplane, d in industry. While urethral stenosis predis-ses to infection by producing residual urine, the creased pressure required to force urine through e narrow area may dilate the prostatic ducts: if fection is present, these dilated ducts may be-me small abscesses: such lesions strongly resist edical treatment. They are most easily identified urethrography.

Diverticula of the urethra and of the prostate ay be congenital or may result from epithelializa-n of abscess cavities. Their presence leads to asis within their lumina, so that infection is stered. and stones may form as water is absorbed, aving urinary salts behind. Such diverticula are ever discovered unless the physician remembers to ok for them. They are best demonstrated with e urethrogram.

Localized proliferative or fibrotic inflammatory sions are fairly common sources of persistent or current infections. Most frequent are the papil-ry or polypoid masses which develop at the inter-al urinary meatus in the female. They probably sult from a combination of circulatory disturb-nce incident both to relaxation of the pelvic floor nd to postpartum scarring, with bacterial inva-on. During an acute attack these proliferative ructures swell, giving rise to a desire to micturate ecause of their presence within the first portion of he urethra. Since they cannot be expelled, the esire persists or soon recurs because of the feeling hat there is something in the urethra. Acute at-acks are associated with pyuria and bacteriuria, nd are usually mistaken for "cystitis." The epi-odes subside with antibiotics, but the papillary tructures remain as areas of lessened resistance, nd almost invariably give rise to subsequent at-acks. Some will disappear with weekly dilatations f the urethra to 30 or 35 French, followed by the opical application of ½ to 1 per cent silver ni-rate; many will require electrocoagulation through he urethroscope.

Cicatricial urethritis (simple fibrosis of the rethra) may cause contracture with obstruction to urination and, consequently, residual urine, and so lead to recurrent infection. For this reason, every woman with chronic or recurrent urinary infection should have the residual urine measured. Weekly dilatations of the urethra after the active infection has subsided will often so improve emptying of the bladder that the pyuria disappears. Failure of the dilatations to bring relief suggests obstruction at the vesical neck, diverticula (quite rare in the female) or neurogenic dysfunction.

Cystic lesions of the vesical mucosa (cystitis cystica) are usually the result rather than the cause of recurrent infections. Occasionally they may become so numerous and so large that it is desirable to destroy them by electrocoagulation.

Recurrent pyelonephritis may cause so much scarring as to impair local blood supply, and so leave the kidney vulnerable to future attacks. Such lesions cannot, of course, be cured. Occasionally they may cause hypertension, which may disappear after nephrectomy if the renal disease is unilateral. When it is bilateral, we must be content with treating the individual attack with antibiotics, not forgetting to explain to the patient the reasons for our inability to prevent recurrences.

One must always remember renal tuberculosis when dealing with unresponsive infections. While pyogenic organisms are not ordinarily found in the urine in tuberculosis (to the extent that a sterile urine culture in the presence of pyuria always brings up the question of tuberculosis), secondary infection may occur even with chills and fever, and so delay recognition of the underlying disease. This is one of the cogent reasons for making urographic and cystoscopic studies in every resistant infection. Careful search for the tubercle bacilli by means of the acid fast stain, guinea pig innoculation and culture will invariably reveal the organism if one persists long enough, but pyelograms should be made before delay has permitted the renal tuberculosis to progress or allowed secondary vesical tuberculosis to cause fibrosis of the bladder.

One cannot honestly say that an infection persists or recurs due solely to bacterial resistance to antibiotics and urinary antiseptics, until careful urography and cystoscopy have demonstrated the absence of the disorders already described, because almost any pyogenic organisms can acquire resistance when attempts are made to eradicate it with antibiotics without correction of the predisposing lesion. Therefore, one should not take the results of sensitivity tests indicating resistance as final without careful and perhaps repeated review of the whole urinary tract. The strains of bacteria most often resistant to drugs are Bacillus proteus, Aerobacter aerogenes, and Pseudomonas aeruginosa, although almost any pathogen may become resistant in some circumstances. Sensitivity tests make a good starting point with antibiotic resistant bacteria. While scientific studies require the use of the serial tube dilution method, this is not necessary for ordinary clinical purposes. One can use Petri dishes containing blood agar, and divide the under surface into labelled quadrants with a wax pencil. Fresh urine collected with sterile precautions is smeared on the agar. "Difco discs," each saturated with an antibiotic to be studied, are dropped onto the agar, taking care that each one corresponds to a labelled segment. Organisms can be classified as resistant if, after twenty-four hours in the incubator, they have grown right up to the edge of the disc. They may be classified as slightly, moderately, or quite sensitive according to the width of any clear zones of inhibition around the discs. While correlation will be far from perfect, the results are useful clinically.

In general, B. proteus is unlikely to respond to any one antibiotic, but many strains will succumb to a combination of two, or to an antibiotic combined with an urinary antiseptic. Combinations likely to be effective include penicillin and streptomycin, Chloromycetin and Gantrisin, and Furadantin and Gantrisin. The first pair has, of course, to be injected intramuscularly. Relatively large doses should be used, say 500,000 units of penicillin and 0.25 gram of streptomycin every four hours. Because of the tendency of the latter to provoke both reactions and bacterial resistance (or even dependence), the course of treatment should be short. More convenient to use and just as likely to be effective are Chloromycetin 0.5 and Gantrisin 2 grams four times daily; at the end of a week the dose is reduced to one half; after another week it is cut to one quarter of the original level, being stopped at the end of the third week. However, if the urine is not grossly clear at the end of the first week, there is no point in continuing this regimen. The third alternative consists of Furadantin 7 milligrams per kilogram of body weight per day divided into four equal doses, and Gantrisin 2 grams four times daily. The former should never be taken on an empty stomach; nausea from the first few doses may disappear if administration is continued. The same practice of halving dose at the end of the first week, and of quarte it at the end of the second is followed; it is stop at the end of the first week if the urine has cleared. The object of the continuing the regir for three weeks is to kill all of the organism possible, since there seems but little doubt many recurrences are due to stopping treatmen soon as the urine clears; the ability of the org ism to grow may be only temporarily impaire this point.

Pseudomonas aeruginosa is usually insensitiv all of the antibiotics ordinarily used, althoug few strains may succumb to one of the tetr clines or to calcium mandelate in adequate d (3 grams four times daily with the fluid int limited to 1200 cubic centimeters). While in tions with these organisms are rarely serious, an casional strain may behave in a highly viru fashion. Here one uses Aerosporin (polymyxin Because of its neuro- and nephrotoxic proper and because it has to be given parenterally, patient should be hospitalized. The drug is mi with 1 per cent procaine and injected intramus larly. Even then, it may cause pain at the site injection. The largest safe dose is probably milligrams per kilogram per day in four equ divided amounts. If treatment is continued more than a few days, the renal function should checked every forty-eight to seventy-two ho while keeping alert for signs of damage to central nervous system.

Aerobacter aerogenes is a close relative of coli, but is far more resistant to antibiotics than latter. Agents most likely to be effective are tetracyclines, chloromycetin, and sulfonamides, that order. Streptomycin may be successful; viously the sensitivity tests are useful here, as as in resistant strains of other species.

Staphylococci which are resistant to penici may succumb to erythromycin, 400 milligrams f times daily. Formerly, the intravenous injection neoarsphenamine or mapharsen in small, frequ doses could be counted upon to cure a few st born chronic infections, but the success of peni lin in the treatment of syphilis has resulted in virtual disappearance of the arsenicals from market. This is particularly regrettable in admittedly rare amicrobic pyuria, which was w to vanish like magic following the use of th agents.

(Continued on Page 306)

oentgenographic Findings in Respiratory roblems of Infants

S. B. FEINBERG, M.D.
Minneapolis, Minnesota

THE acute respiratory problem of the neonatal period is one which often requires rapid diag- osis to insure proper therapy. The gradually eveloping lesions can be handled more leisurely; evertheless, both the acute and chronic lesions ave roentgen findings which will frequently aid e clinician in diagnosing the case. The clinical nd roentgen findings together will be of more alue than either one alone. These entities will e discussed in the order in which they might be ncountered during neonatal and early childhood periods.

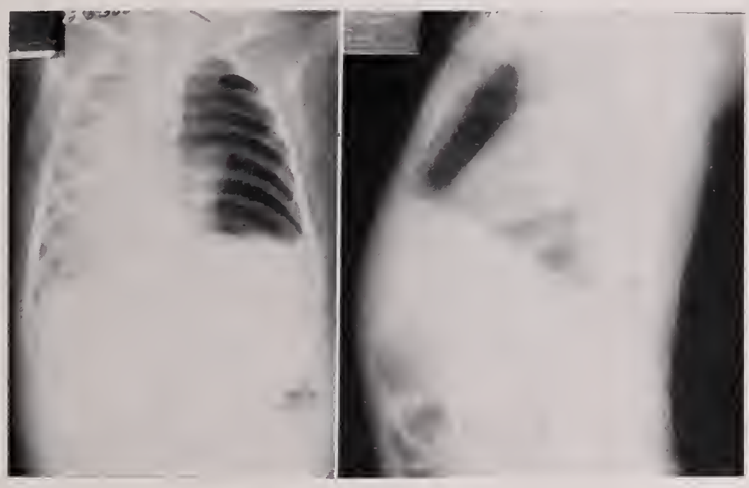


Fig. 1. (Case 1) A five-day-old white male child who had acute respiratory distress from birth. Diagnosis: crush type hydropneumothorax with shift of the heart and mediastinum.

Birth trauma frequently results in an asymptomatic pneumothorax, especially in the premature infant. Only those cases which have marked collapse of the lung with resultant respiratory distress are examined radiographically. Fractured ribs are rarely found. The development of the pneumothorax is usually due to a crush injury which is the same in infants and adults. Simple alveolar rupture into the pleural space or retrograde passage along the perivascular tree to the hilar root, free pleural space, mediastinum, and subcutaneous tissues[1] are the two routes for the passage of air (Fig. 1).

Aeration and expansion of the lungs are gradual processes especially in premature infants. When the process of inflation fails to occur, which is thought to be on an obstructive basis by some,[2] various degrees of distress, cyanosis, and even death will follow.

Farber and Wilson[3,4] have shown that there is physiologic atelectasis of varying magnitude during the first four days of life in full-term infants who have no respiratory distress. In contrast, the premature infants' lungs may not fully expand for from four to six weeks. They feel that cohesive forces, faulty or ineffective function of the respiratory centers and an underdeveloped thoracic cage are more important in the failure of expansion in primary atelectasis than is true obstruction, which has been postulated as the cause of fetal atelectasis.

A problem which is particularly interesting to us at the University of Minnesota Hospitals is that of hyaline membrane disease. It is not found in stillborns or within the first hour of life.

From the Department of Radiology, University of Minnesota Hospitals.

Lungs are the poorest developed organ at birth and have to take on an entirely new function at birth.[5] At the four- to five-month stage of gestation. gas exchange would be impossible. The respiratory tree is lined by cuboidal cells which separate the blood vessels from the potential air space. If the infant were born at this stage, the cuboidal cells would prevent passage of air. At the fifth month, capillary buds begin to push the epithelium aside and are exposed to potential air spaces. By the seventh month, sufficient capillaries are exposed to sustain life. Anything which interferes with this process is a hazard to life, which accounts for more difficulty in prematures.

In hyaline membrane disease. the infant will usually breathe spontaneously. Later, the respirations become labored and are accompanied by retraction of the thoracic wall. Occasionally there is recovery, more often death occurs in forty-eight hours. Grossly the lungs are dark red and firm and sink in water. Capillary engorgement is a microscopic finding. The major alveoli and respiratory ducts are collapsed. The few remaining air spaces are lined with a hyaline membrane.

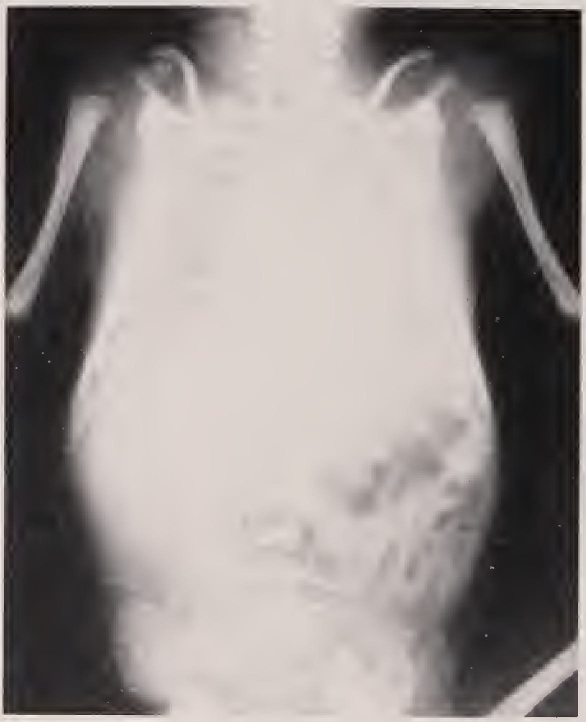


Fig. 2. (Case 2) A premature with respiratory distress at eight hours at which time retraction developed. Radiographs and thoracotomy showed atelectatic changes compatible with the diagnosis of hyaline membrane disease. Autopsy showed secondary atelectasis with hyaline membrane lining of many alveoli.

The exact etiology is unknown. Aspiration amniotic fluid has been considered as the cau for many years.[6,7] This view has been challenged,[8-] and the role of capillary exudation and other bi chemical factors must be considered.

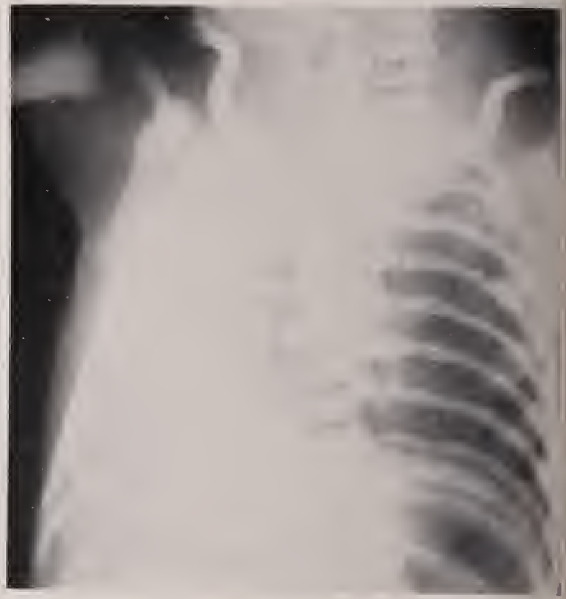


Fig. 3. (Case 3) A one-day-old female child who ha a tracheoesophageal fistula. There was also respirator distress thought to be due to aspiration pneumonit and/or atelectasis. Chest study showed shift of the hea and mediastinum to the right with compensatory emph sema on the left. A differentiation between agenesis an atelectasis had to be made. Autopsy findings showed th fistula, agenesis of the lung, and aspiration pneumoniti

The roentgen findings have been described[12-] as ranging from generalized granularity or nodu larity, to complete atelectasis with or without pe ripheral emphysema (Fig. 2). At present, we ar attempting a study to follow the roentgen evolu tion of the disease more closely.

Not all respiratory problems of infants are du to bizarre causes. Most cases involve simple pos partum pneumonitis[15] or aspiration. One must als consider the possibility of an underlying anomal such as a tracheo-esophageal fistula with secondar aspiration, atelectasis, or both. Likewise, pulmo nary anomalies, such as agenesis of the lungs, ma be misinterpreted as an acquired disease (Fig. 3 Bronchography and planigraphy are necessary t confirm the diagnosis.[16] Infantile myasthenia grav may show swallowing problems with secondar aspiration and pneumonia. We must also acknow edge the congenital diaphragmatic hernia as a occasional cause of neonatal respiratory distress a esult of compression of lung parenchyma by the rathoracic location of abdominal viscera.

As described by Henry[17] and Van Epps,[18] hypert phic lobar emphysema is an acute respiratory oblem found primarily in the new born. Dyspnea d cyanosis often develop within a few days of rth. No infectious disease is present (Fig. 4). arious causes for the finding have been listed, ch as, redundant bronchial mucosa acting as a eck valve, abnormal cartilagenous ring development, aberrant vessel compression, and a stenosed onchus. Some cases have no discernible bronial lesions. The lungs are overdistended and aparently quite pink. They remain distended after moval, suggestive of an elastic tissue abnormality.

The course is one of a normal infant who bemes dyspneic with or without cyanosis shortly fter birth. On examination they have classical mphysematous findings with no evidence for inammation. The signs and symptoms are more larming than in cases of true cysts. Radiologic ndings are those of localized lobar distribution of mphysema, manifested by a large translucent zone onfined to a lobe with adjacent compression, ediastinal shift, and compensatory herniation. he septa of cystic disease are absent. Johns[19] xpressed the opinion that all non treated cases ied. Caffey[20,21] described spontaneous regressions. The decision to excise the lobe depends on the degree of hypoxia and respiratory embarrassment.

Cystic disease, either congenital or acquired, must be differentiated from lobar emphysema. In the obstructive cyst, tension pneumothorax must be excluded.[16] Whether closed or open, these conditions are not recognized early unless they become infected or compress much lung parenchyma. The closed cysts may be fluid filled and as a result are not radiographically translucent. The air filled pneumatocele, by contrast, will cause various degrees of translucent replacement and displacement of lung parenchyma, sometimes simulating a tension pneumothorax with shift of the heart and mediastinum to the opposite side (Fig. 5). There may be associated circulatory compression.[22] Septa are a diagnostic feature in this entity. Post inflammatory pseudocysts can produce similar clinical findings, but they do not involve alveoli or bronchi[23] (Fig. 6).

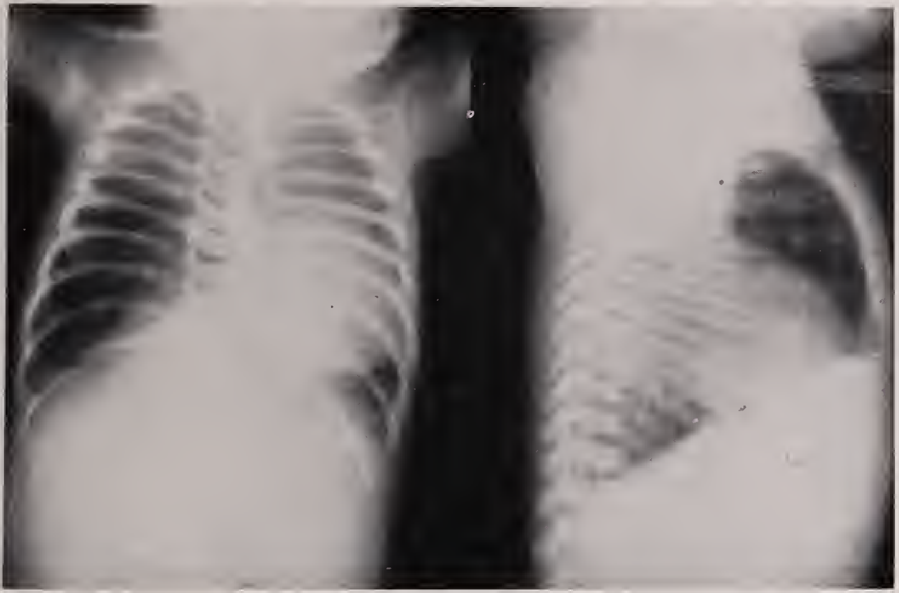


Fig. 4. (Case 4) A seven-day-old female child who had marked respiratory distress and cyanosis from the third day. X-ray showed mid lung field emphysema and compression atelectasis of the right upper and lower lobes. Impression: hypertrophic lobar emphysema. (Surgery—lobectomy confirmed the diagnosis.)

Figure 4 is presented through the courtesy of Drs. Roger Lienke and E. F. Van Epps, University of Iowa, and by permission of the publishers of *The American Journal of Roentgenology, Radium Therapy, and Nuclear Medicine.*

The histological differentiation between congenital and acquired cysts is difficult. Condon[24] has shown that respiratory epithelium responds rapidly to injury and that epithelial linings *per se* are no index to the congenital nature of the cyst.

Methemoglobinemia[25] due to ingestion or absorption of various chemicals such as nitrites, ace-

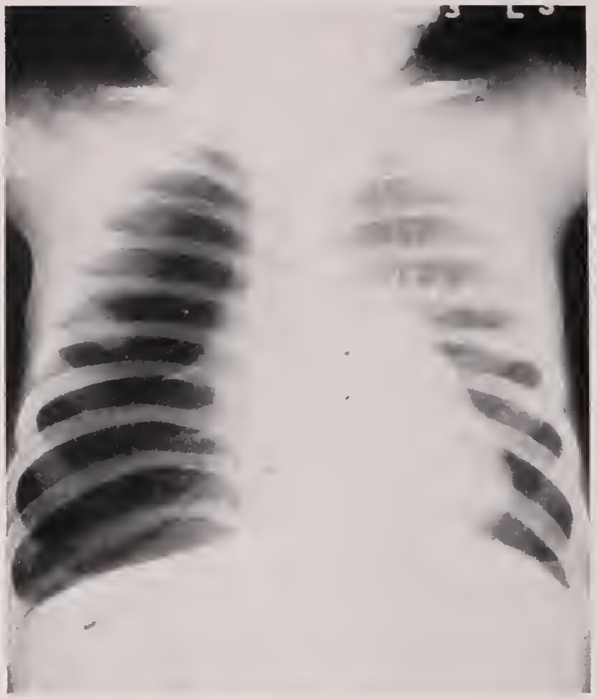


Fig. 5. (Case 5) A two and a half year old boy who tired easily but a lesion was not discovered until nine months of age when an x-ray was taken. There was marked lung field translucency with compression of the heart and mediastinum to the left. Septa were present. Diagnosis: cyst. Surgical and pathologic diagnosis: congenital cysts.

tanilid, potassium chlorate, nitrobenzol, etc., r sults in the formation of an oxyhemoglobin which the oxygen is firmly bound and which dc not function in respiratory exchange. As a resu cyanosis is the presenting finding with dyspne Congenital heart disease is often suspected. V recently had a patient who was clinically suspect to be an example of tetralogy of Fallot. Radi graphically there was questionable increase in lu field translucency. The cyanosis cleared after o day of hospitalization in the Heart Hospital, and was found to be due to a high concentration nitrites in well water. The outcome of this ca was fortunate, but the disease can be fatal if n recognized. Actually there are no diagnost roentgen findings.

Arteriovenous aneurysms[26] are another cause f cyanosis in the infant even though the lesions a usually discovered later in life (Fig. 7). If tl shunt is large enough, cyanosis can be recognize early. The usual later findings are clubbing of tl fingers, exertional dyspnea, cardiac strain, and se ondary polycythemia. A bruit is sometimes hear over the area. Due to shunting of the bloc through the malformation, there is often a d creased parenchymal vascular pattern. In the are of the lesion, a serpiginous shadow radiating fro the hilum is the expected finding. Often, these a

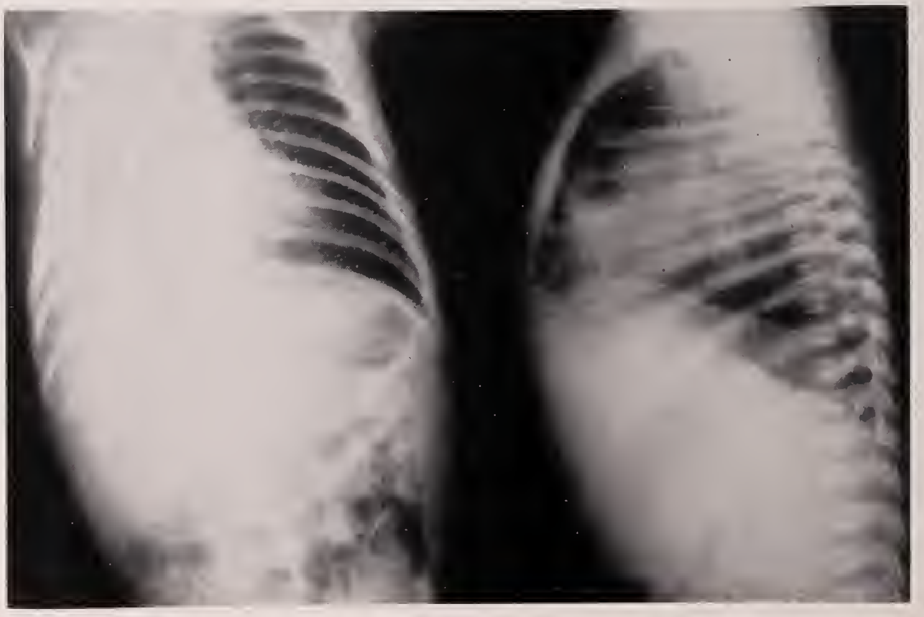
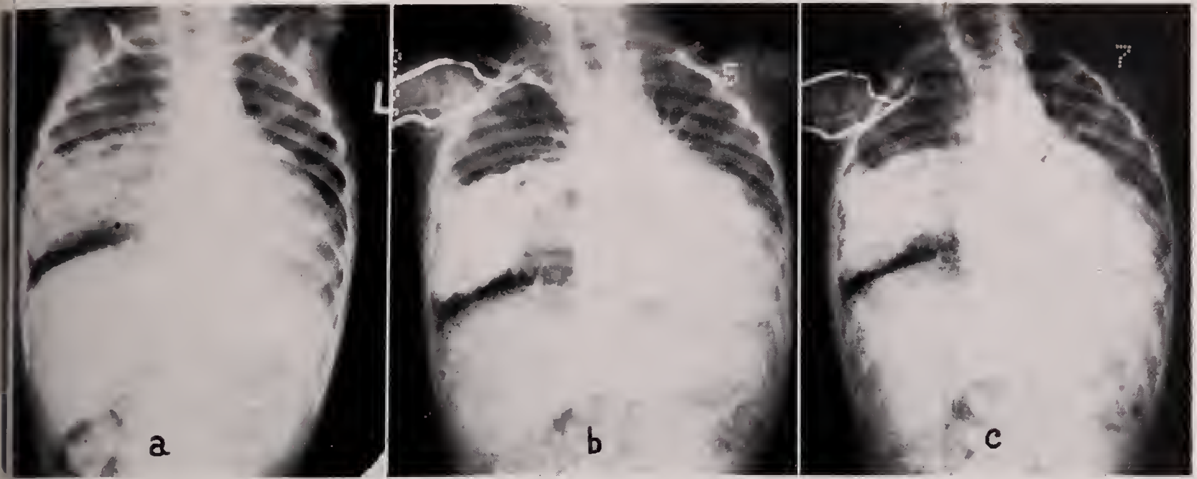


Fig. 6. (Case 6) A one-month-old boy who developed aspiration pneumonia after a herniorraphy on the first day of life. This was followed by effusion and post aspiration empyema. The empyema loculated anteriorly and was followed by anterior cystic lesions of the interstitial, extra-alveolar pseudocyst variety.



ig. 7. (Case 7) (a) Male child born in a tuberculosis sanitarium was not seen by mother until two months, d she wasn't aware of cyanosis until nine months. The right middle lobar patchy density had a central cluster sharply circumscribed densities suspected of being an anteriovenous aneurysm. No bruit was heard. (b and c) An-gram confirmed the diagnosis. Surgery confirmed the finding but the child died of cardiac decompensation and ma.

ltiple with smaller defects that do not become parent until the obvious lesion has been re-oved.

Summary

Many pulmonary problems which present with spiratory distress and cyanosis in the neonatal riod and infancy have been discussed and their entgen manifestations demonstrated. The com-nation of clinical, radiologic, and laboratory dies will often lead to the correct diagnosis and eatment.

References

. Macklin, M. T., and Macklin, C. C.: Malignant interstitial emphysema of the lung and mediastinum as an important occult complication in many respiratory diseases and other conditions. Medicine, 23: 281, 1944.
2. Caffey, J.: Pediatric X-Ray Diagnosis. 2nd ed. Chicago: Year Book Publishers, 1950.
3. Farber, S., and Wilson, J. L.: Atelectasis of the newborn. Am. J. Dis. Child., 46:572, 1933.
4. Wilson, J. L., and Farber, S.: Pathogenesis of atelectasis of the newborn. Am. J. Dis. Child., 46:590, 1933.
5. Potter, E.. Pathology of prematurity. J.A.W.M.A., 5:391, 1950.
6. Bruns, P. D., and Shields. L. V.: Pathogenesis and relationship of hyaline-like pulmonary membranes to premature and neonatal mortality. Am. J. Obst. & Gynec., 61:953, 1951.
7. Blystad, W.; Landing, B. H., and Smith, C. A.: Pulmonary hyaline membrane in newborn infants. Ped., 8:5, 1951.
8. Miller, H. C., and Jennison, M. H.: Study of pulmonary hyaline-like material in 4117 consecutive births. Ped., 5:7, 1950.
9. Miller, H. C., and Hamilton, T. R.: The pathogenesis of vernix membrane. Ped., 3:735, 1949.
10. Miller, H. C.; Behrle, F. C., and Gibson, D. M.: Comparison of pulmonary hyaline membrane in vagotomized rabbits with those in newborn infants. Ped., 7:611, 1951.
11. Behrle, F. C.; Gibson, D. M., and Miller, H. C.: The role of hyaline membrane and blood exudate in preventing expansion. Ped., 7:782, 1951.
12. Martin, J. F., and Friedell, H. L.: Roentgen findings in atelectasis of newborn. Am. J. Roentgenol., 67: 905, 1952.
13. Manges, W. F., and Farrell, H. T., Jr.: Roentgen differential diagnosis of atelectasis. Am. J. Roentgenol., 30:429, 1933.
14. Meschan, I.; Marvin, H. N.; Gordon, V. H., and Regnier, G.: The radiographic appearances of hyaline disease of the lungs in the newborn. Radiol., 60:383, 1953.
15. Rubin, M.: Diseases of the Chest. Philadelphia: W. B. Saunders Co., 1947.
16. Schinz, H. R.; Baensch, W. E.; Friedl, E., and Uehlinger, E.: Roentgen Diagnostics. Vol. III. New York: Grune and Stratton, 1953.
17. Henry, William: Localized pulmonary hypertrophic emphysema. J. Thoracic Surg., 27:197, 1954.
18. Van Epps, E. F., and Davies, D. H.: Lobar emphysema. Am. J. Roentgenol., 73:375 (March) 1955.
19. Johns, Wm. A.: Localized pulmonary hypertrophic emphysema. Virginia: M. Monthly, 80:618, 1953.
20. Caffey, J.: Regional obstructive pulmonary emphysema in infants and children. Am. J. Dis. Child., 60: 586, 1940.
21. Caffey, J.: Natural regression of pulmonary cysts during early infancy. Ped., 2:48, 1953.
22. Wissler, H.: Bedeutung and Prognose des Spontan-Pneumothorax im Kindesalter, Jahrb. F. Kinderh., 150:11, 1937.
23. Hossli, G.: Seltene intrathorakale cysten die medem. Verdauungstrakt in Beziehung Stehen. Langenbechs Arch. u Deutsch J. Chir., 265:551, 1950.
24. Condon, W. B.: Regeneration of tracheal and bronchial epithelium. J. Thoracic Surg., 2:333, 1942.
25. Mitchell and Nelson: Textbook of Pediatrics. Philadelphia: W. B. Saunders Co., 1954.
26. Sloan, R. D., and Cooley, R. N.: Congenital pulmonary arteriovenous aneurysm. Am. J. Roentgenol., 70:183, 1953.

Electrolyte Disturbances in Dehydration

WILLIAM M. WALLACE, M.
Cleveland, Oh

THE successful and definitive repair of dehydration and its accompanying abnormal states of acid-base equilibrium depends more upon the kidney and the cybernetic mechanisms controlling its function than it does upon the acumen of the clinician in selecting the type and quantity of fluid to be administered. The history of parenteral fluid therapy is replete with eponymic solutions of great diversity and complexity, all of which have been used with surprising success to restore the volume and composition of the body fluids. As the sophistication of technique progressed, the view of the underlying mechanisms upon which rational and intelligent therapy could be carried out was lost. Talbot, Crawford and Butler[1] have rendered the good service of reminding us of the items just noted and have pointed out the corollary that, if the body is offered quantities of water and ions within the ability of the kidney to conserve or reject these substances, a proper sorting out will occur and normality will be quickly restored. One major difficulty seems to fall in the way of giving the kidney all of the responsibility for therapy. At times it may not be working properly, either for reasons of its own or because its communication system has gone awry. In about eighty out of a 100 instances, routinized therapy for dehydration and its associated ionic disturbances will work admirably and produce the desired results. In a few of the remaining twenty instances, no therapy will be successful as the physiologic pathology will have gone so far as to be irreversible. In other instances the deficits are bizarre or the homeostatic links required for adequate renal control are broken. Therapy in this same group, if it is to be successful, must be based on understanding of mechanisms. The use of formulas and tables will fail. Clinical observation and reflection will often serve to identify the patient in whom normal homeostatic mechanisms will fail to aid therapy. At times failure to respond to standardized forms of therapy may give the clue that the situation is unusual one.

Figure 1 indicates the idealized homeosta mechanisms by which the organism postpon death from circulatory failure as water depriv occurs and progresses. It should always be bor in mind that the basic cause of death in dehydr tion is reduction of blood volume below a critic point where circulation fails. While the diagra is constructed to indicate the events occuring pure water deficit (man in the desert), it for the basis for critical thinking about what happe to the patient who, in addition to being unable take or retain water by natural means, suffers fro deficit of renal, adrenal or pituitary function from wasting of body electrolyte.

The diagram is best understood by followi down the two sides simultaneously until the fin credit for the whole transaction has run out, ar the debit is ready for therapy. Once water inta stops, from whatever abnormal cause, deficit in mediately results because of the continuous obli atory loss of water from the skin, lungs and ki ney. The process is analogous to the boiling aw of water from a pot on the stove. Loss of wat can only be stopped by putting out the fire. water thus leaves the body, the volume of extr cellular fluid (ECF) is first to decrease. Simu taneously, as indicated on the right side of t diagram, the factors of infection, trauma, pai and fasting lead to increased ACTH productio by the pituitary. The increased ACTH resu in production of the catabolic adrenal hormo hydrocortisone. Decreased ECF (or blood vo ume) appears to directly stimulate the productio of the sodium retaining adrenal hormone aldo terone. This sequence is indicated by the arro across the top of the diagram. The question ma breaking the arrow indicates lack of comple experimental proof of the sequence. Decrease body sodium or increased body potassium ma also be factors. Returning to the left side, we s that, as volume falls, the osmotically active solut mainly sodium and chloride, of the ECF tend t rise. This increase in concentration is accentuate

---

From the Department of Pediatrics, Western Reserve University, and University Hospitals of Cleveland, Cleveland, Ohio.

Presented at the Fall Meeting, Northwestern Pediatric Society, Bayport, Minnesota, September 23, 1955.

t the renal retention of sodium secondary to the ect of aldosterone on the renal tubule. The rise i concentration of sodium in the plasma leads to s rction of antidiuretic hormone (ADH) by the sterior pituitary as has been so beautifully shown Verney.[2] In turn, ADH leads to maximal wa- reabsorption by the kidney as indicated by ximum specific gravity of the urine. A sec- d consequence of the increased sodium concen- tion is the transfer of intracellular water to the F in response to the now imbalanced osmotic essure. Transfer of water is further aided by the tabolic effects of hydrocortisone secreted in re- nse to the stressful stimuli. Under such hor- onal actions the individual, in effect, "self-feeds" mself from his own body substance. Potassium d nitrogen are lost from the cell and water and lories become available. Aldosterone again steps to the homeostatic chain by facilitating the re- l excretion of potassium and preventing a lethal e of this ion in ECF.

The events just described allow the ever-increas- g deficit of ECF to be shared by the relatively uch greater volume of intracellular water. Fur- ermore, as long as homeostasis succeeds, little ange in electrolyte concentrations will occur. dium, potassium and nitrogen (urea) concen- ations will be normal. As Gamble[3] has pointed it, these mechanisms greatly multiply survival me under water deprivation. Without these echanisms for spreading water deficit over all e body water, the circulating fluid volume would e quickly wiped out.

Changes in the plasma concentration of sodium, otassium and urea should indicate to the clin- ian that the ultimate strain has been placed on e mechanism or that somewhere the process is ot working properly. If the adjustments have een perfect, the only abnormality will be reduc- ion in volume of the body fluids and net loss of xtra-and intracellular electrolyte. In very general erms we know that when 10% of the body eight has been lost as water, the final strain be- omes evident in the form of peripheral circula- ory failure and beginning distortion of the ECF onic pattern.

Modern concepts of fluid therapy are designed o reverse and take advantage of the sequences ust described. The initial attack is made upon estoration of circulating volume by means of arious facsimiles of ECF varying in sophistication rom "normal" saline to lactated Ringers solution. Simultaneously, or very closely thereafter, provision must be made for the obligatory expenditure of water from skin and lungs and for water to relieve the kidney of the burden imposed upon it by ADH and the need for excretion of products of cell breakdown. This combined operation is accomplished by the administration of solutions containing one-third to one-half the concentration of electrolyte contained in so-called "normal" saline. Reflection about the sequences shown in Figure 1 will indicate that the practice of infusing saline solution or saline in glucose alone in dehydration does little but accentuate the disturbance. The ill effects of fluid volume deficit may be temporarily overcome but any gain is quickly offset by the subsequent accentuation of abnormal plasma electrolyte pattern. Success in treating dehydration with isotonic saline in the past indicated that the extraordinary fortitude of the kidney coupled with the fact that restoration of circulating volume revived the patient sufficiently so that he could drink naturally occurring hypotonic fluids. With present-day knowledge it is better not to gamble on these possibilities.

Once the threat or actuality of circulatory failure has been removed and the kidney "primed," the beginning of repair of the intracellular fluid may be carried out by provision of potassium in the administered fluids. If potassium is not provided, sodium ion will take its place in intracellular fluid. This latter occurrence, if of the usual limited degree, seems of no clinical significance but if extensive, produces clinical symptoms.[4,5] Provision of potassium in parenteral fluids is generally only necessary when a prolonged period (two days or longer) of parenteral fluid therapy becomes necessary.

In a certain small number of patients the homeostatic mechanisms will have failed and cannot be depended upon to aid in therapy. Clinical observation and intelligent use of the laboratory will serve to identify these patients and to guide therapy. It is obvious that any break in the mechanisms shown in Figure 1 will prejudice operation of the whole system. The clinically most common examples are abnormal extrarenal loss of sodium salts or failure of the kidney to conserve them. Loss of sodium through diarrhea, vomiting suction drainage, sweating, diuresis or failure of the renal sodium conserving mechanisms allows ECF sodium concentration to fall as water deficit increases. As a consequence, ADH secretion fails to occur as does osmotic transfer of water from intracellular fluid. The brunt of dehydration falls on the ECF alone, and the critical point in reduction of circulating volume is reached in hours rather than days. The patient with adrenal insufficiency is the rare but pure prototype of such a failure of homeostasis. So-called "base-losing nephritis" and instances of suction drainage without adequate electrolyte replacement are more common examples. Patients with salt depletion in excess of water can often be clinically identified. Signs of peripheral circulatory failure are profound, blood pressure is low and pulse rate high, skin turgor is decreased to an exaggerated degree, and the traditional Hippocratic facies are present. Physical examination shows a generalized muscular hypotonia. Unless the condition is far advanced, the sensorium is clear and the psyche seems dominated by alternate lassitude and anxiety. The plasma sodium concentration is low and potassium and urea high. The routine administration of hypotonic potassium-containing solutions to such patients accentuates the clinical and chemical disturbances and results in deterioration of the situation. Such patients are, in effect, suffering from water i toxication. Their initial therapy must be wi isotonic solutions of electrolyte, not hypotonic. the severely ill patient with dehydration treat pragmatically with hypotonic solutions, caref watch should be kept in the six to eight hou following initiation of intravenous fluid therap If the typical favorable response does not follo in this period, the suspicion of hypotonic dehydr tion should be raised, and therapy should changed to that with isotonic solutions of electr lyte. Correlation of the clinical state with mea urement of the serum sodium or chloride conce tration is invaluable at this point.

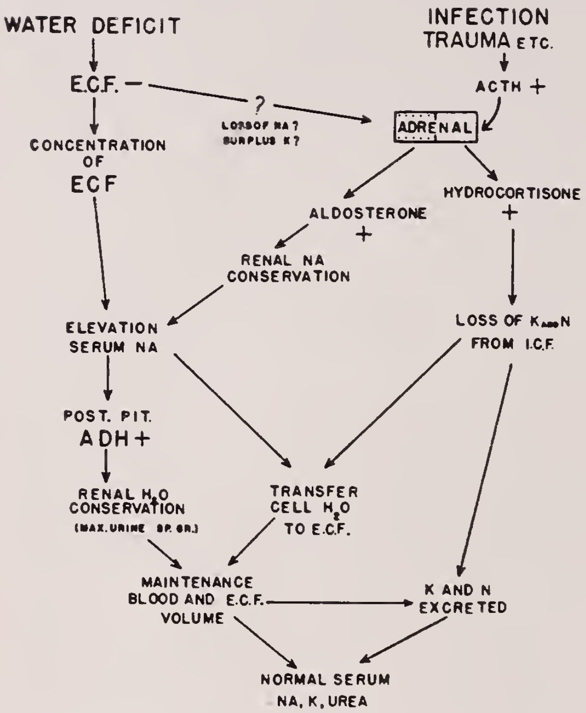


Fig. 1. Schematic presentation of the homeostatic mechanisms acting during water deficit. + or — signs indicate that a function is increased or decreased. E.C.F., extracellular fluid; ADH, antidiuretic hormone; I.C.F., intracellular fluid. For explanation see text.

In a goodly number of instances of dehydratio particularly in infancy, the homeostatic mecha isms seem to have over-reacted to the stimulus dehydration. Sodium retention by the kidney h been intense, and the expenditure of water witho salt from the skin, lungs and intestinal tract u duly high. The situation is crudely analogous that of a beaker of saline solution boiled to ne dryness over a flame. The concentrations of s dium and chloride in the plasma are far abo normal. The dehydration may be termed "hype tonic." Again, good clinical observation will ide tify many of these infants. Their appearance nearly the opposite of those with low sodium co centrations. Signs of circulatory failure are min mal; skin turgor is deceptively normal, and th eyeballs are not sunken. Unlike the patient wit salt depletion and dehydration, they are out contact with the environment. Their extremiti and back are stiff or even rigid, and the examin gains the impression that they are close to th convulsive point. Often this is true. In infan the initial mistaken diagnosis of meningitis is ofte made, and the water defict ignored. If sought, lab oratory signs of central nervous system damage a usually found. Spinal fluid proteins are near always increased and the EEG abnormal. Figu 2 shows the initial EEG tracing in an infant who serum sodium concentration reached the rath astounding value of 200 mEq./l. as a result dehydration secondary to gastroenteritis. Eig days later, after appropriate therapy, the traci is normal. Usually the lesions seem function and reversible, although in a few instances th presumed chemical trauma seems to be permanen Abnormally high concentrations of serum sodiu are frequently encountered in patients with pri central nervous system disease.[6] Time does n

ow complete discussion of the pathologic phy-
slogy of this type of dehydration. This can be
und elsewhere.[7,8,9] Suffice it to say that the
int of the water deficit has been borne by the
racellular rather than the extracellular fluid.
tracellular volume seems to be relatively intact.
ss of potassium does not seem to occur. Ionic
ncentrations within cells, like extracellular con-
itrations, are high.

The question may be asked as to the relative
quency of abnormal states of ionic concentra-
n in dehydration. In a two-year period at Babies
d Children's Hospital of Cleveland, 220 out of
00 admissions were instigated with dehydration
an urgent diagnosis. In seventy-seven instances
asurements were made of the serum sodium
ncentration before therapy was initiated. Seven-
per cent of the seventy-seven were in the normal
nge (130 to 150 mEq./l.); 20 per cent of the
ncentrations were over 150 mEq./l., and 10 per
nt under 130 mEq./l. Presumably the majority
oup had come along the path of dehydration
th normal homeostatic mechanisms in operation.
the majority group a single parenteral solution
th an electrolyte concentration of 50 to 70
Eq./l. would serve for ideal repair. In the re-
aining patients individualized therapy based on
inical observation supported. if possible, by labo-
tory measurements would be essential for effec-
ve therapy.

Before concluding, note should be taken of the
id-base disturbances that inevitably accompany
hydration. They are the result of differential
sses of cation (base) and anion (acid) in intes-
nal fluids and urine coupled with the increased
quirement for anion excretion occasioned by the
estruction of tissue outlined above. Correction of
ese disturbances depends upon restoration of cir-
ulatory efficiency and the consequent return of
nal function. Correction of the acidosis by infu-
on of alkaline solutions should be a strictly sec-
ndary consideration in planning therapy. The
istory of parenteral fluid therapy supports this
ntention. The earliest attempts at the begin-
ing of this century to understand and study the
athologic physiology of diarrheal disease centered
bout the finding of acidosis in the blood of these
atients. At that time little understanding existed
ncerning the volume and composition of the
ody fluid compartments and their critical rela-
onship to circulatory and renal function. Thera-
eutic efforts centered around the administration of strongly alkaline solutions in small volume. Such procedures increased mortality and were soon abandoned. Some years later Hartman pointed out the therapeutic efficacy of combined procedures to restore both the volume and the ionic composition of the body fluids.

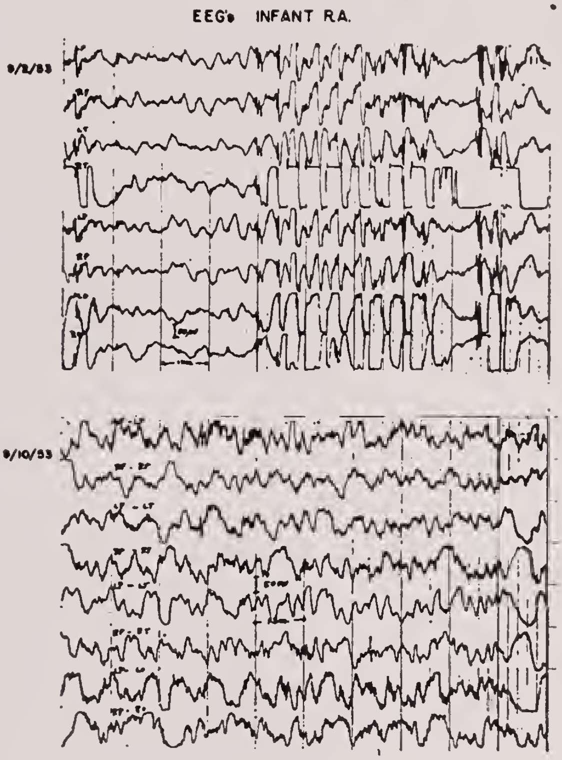


Fig. 2. Electroencephalogram of a 6 months' old child with severe hypertonic dehydration. The tracing at the top was made when the serum sodium concentration was 200 mEq/l. The lower tracing, 8 days later, was made at recovery.

Summary

The homeostatic mechanisms utilized by the body to defend itself against dehydration have been described. The central role of these mechanisms is to sustain for the longest possible period of time the circulating volume and composition of the body fluids. In disease these adaptive mechanisms may fail. The clinical signs indicating such failure and their correlation and corroboration with and by laboratory measurements are discussed. Therapy of dehydration is discussed in light of these concepts.

References

1. Talbot, N. B.; Crawford, J. D., and Butler, A. M.: Homeostatic limits to safe parenteral fluid therapy. New England J. Med., 248:1100, 1953.

(Continued on Page 313)

Seminar

THE PYRROL PIGMENTS AND HEMOGLOBIN CATABOLISM

C. J. WATSON, M
Minneapolis, Minnes

THERE is a singular merit in the establishment of an E. T. Bell lectureship by the Minnesota Pathological Society. Dr. Bell has nurtured this society from its neonatal period. His guiding hand and penetrating wisdom, mellowed with his delightful sense of humor, have been mainstays of the society these many years. As one of his former and, may I say, continuing students for many years, it is a special privilege for me to give this first E. T. Bell Lecture.

I thought it might be appropriate to discuss a topic in which I became interested nearly thirty years ago, while a member of Dr. Bell's department. The general character of the advances in that interval of time depends, of course, upon many factors, among which may be mentioned a greatly augmented knowledge of porphyrin and bile pigment chemistry gained in part by older, classical methods. The more recent advances in this area rest on many new techniques, especially the application of the chromatographic method and the utilization of isotopic tagging. Some of the most significant advances were enabled by the discovery of Shemin and co-workers[1,2,3] that glycine and acetate are the essential building blocks of the porphyrin and bile pigment molecules. This, together with Westall's isolation of the monopyrrolic precursor, Waldenström's porphobilinogen,[4] and subsequent studies of intermediary substances, has provided clear insight as to the anabolic aspects of hemoglobin (heme) metabolism. While this is not the topic that I shall devote the most time to, it is desirable to comm briefly on the main facts that have now emerg in order that anabolic and catabolic pathw may be in some measure compared.

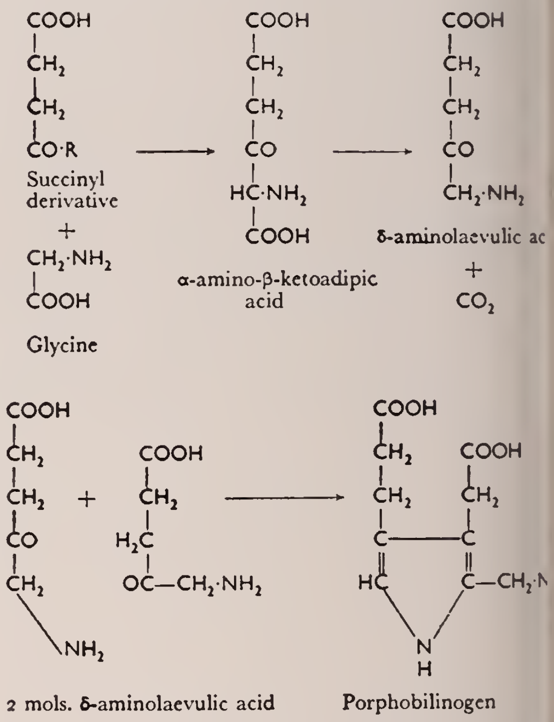


Fig. 1. Stages in the biosynthetic pathway to porp bilinogen. Four molecules of porphobilinogen are th employed in the formation of uroporphyrin, the a-N group at the right being split off. (From C. Rimingt "Porphyrins" in *Endeavour,* page 135, July, 1955. R produced by permission of the publishers.)

Of considerable interest is the recent emergen of porphobilinogen as the first pyrrol to be form along the anabolic pathway to heme. Hithe this was known only as the Ehrlich reacting co pound characterizing the urine in acute porphyr The isolation of porphobilinogen from such ca is an excellent example of the fashion in which relatively rare disease may provide the key to phenomenon of much more general significan

---

The first E. T. Bell Lecture of the Minnesota Pathological Society.

From the Department of Medicine, University of Minnesota Medical School and Hospital, Minneapolis. The studies in this laboratory have been supported in part under contracts with the Surgeon General's Office, U.S.A., and the Atomic Energy Commission. Presented in part at the meeting of the Minnesota Pathological Society, October 18, 1955.

This lecture will appear in three installments, of which this is the first.

e structure of porphobilinogen was established b Cookson and Rimington.[5] The studies of S min and co-workers[6] in this country, and of uberger and associates[7] in England, have clearly own that glycine and acetate are utilized in the osynthesis of porphobilinogen, with β-ketoadipic d δ-aminolevulinic acids as the intermediary mpounds. This relationship is well shown in gure 1, reproduced from a recent paper by imington.[8] The pathway from the porphobili-ogen to the protoporphyrin of heme is not so ear. It will suffice to note at present that the ncept of transition from porphobilinogen→uro-→copro-→protoporphyrin[9,10,11a] was not supported Dr. Schwartz' studies in this laboratory,[11b], hich suggested either that a primary change ight occur in some fraction of the porphobilinogen olecule, to explain the independent formation various porphyrins, or that the transition from ro- to copro- to protoporphyrin might occur only ith proporphyrins (porphyrinogens or reduced orphyrins).* Rimington[8] has recently mentioned e latter possibility.

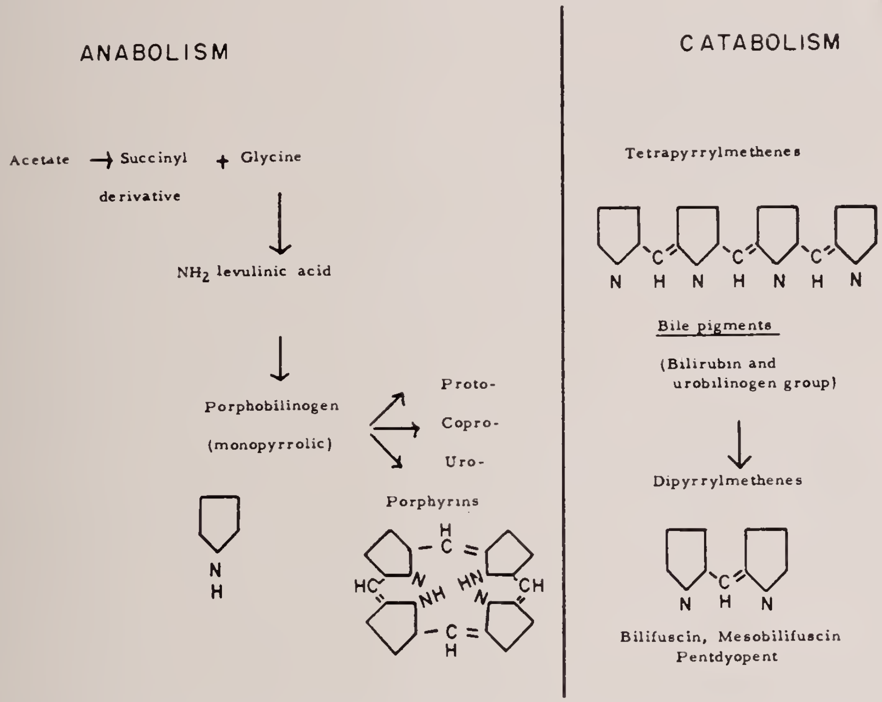

ANABOLISM
Acetate → Succinyl derivative + Glycine
NH2 levulinic acid
Porphobilinogen (monopyrrolic)
N H
Proto-
Copro-
Uro-
Porphyrins
H C
HC
N
NH
HN
N
CH
C H
CATABOLISM
Tetrapyrrylmethenes
C C C
N H N H N H N
Bile pigments
(Bilirubin and urobilinogen group)
Dipyrrylmethenes
C
N H N
Bilifuscin, Mesobilifuscin
Pentdyopent

Fig. 2. The anabolic and catabolic relationships of the porphyrins and bile pigments, in skeleton outline.

With this brief survey of the anabolic side it will be my purpose now to consider the problem of catabolism. In Figure 2 an introductury skeleton outline is shown contrasting the anabolic and catabolic aspects of hemoglobin metabolism, from the standpoint of the pyrrol compounds. In relation to this outline I shall strive to present what I consider to be the more important recent advances and relate them to the more essential information from the past.

Conversion of Hemoglobin to Bilirubin

Lest there might be some thought that this subject does not have its traditional place in pathology I will commence my story by reference to the article by Virchow in the first volume of his "Archives of Pathology," 1847,[12] in which he documented for the first time the classical observation that hemoglobin is converted to bilirubin, or as he called it, hematoidin, when blood is extravasated in tissue spaces. Many pathologists after Virchow have concerned themselves with the problems of bile pigment formation and pathogenesis of jaundice. Among these may be mentioned Ludwig Aschoff, John McNee, George Whipple, Peyton Rous, Frank Mann and Arnold Rich. Although in the ensuing three-quarters of a

---

*In a recent study with F. Bashour and S. Schwartz, be published in detail elsewhere, N_{15} labeled uro-orphyrinogen I was converted by dog liver homogenate, *vitro,* to coproporphyrin and protoporphyrin.

century after Virchow's observation there was continued argument as to whether his hematoidin was identical with bilirubin, the principal bile pigment, the crystallographic studies of Fischer and Reindel in 1923[13] left no doubt that crystalline bilirubin as obtained from cattle gallstones or bile was identical with that forming in the tissues from extravasated hemoglobin. As we shall see in the following, however, there is a question whether the process of isolation from gallstones or bile induces a molecular change from a differing compound to the well-defined crystalline bilirubin.

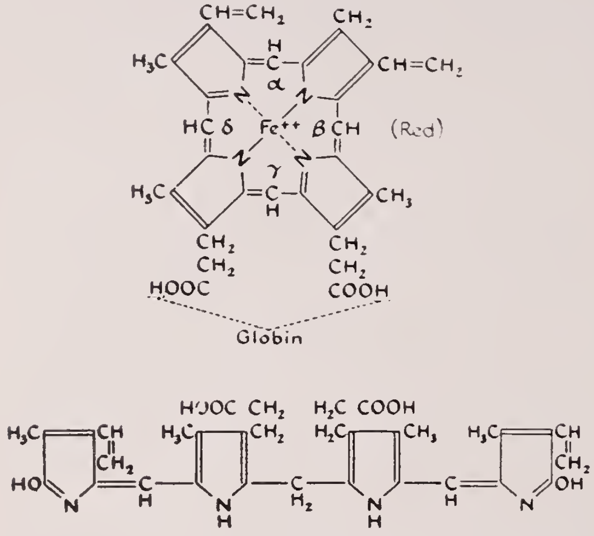


Fig. 3. Ferrous protoporphyrin globin (hemoglobin) and bilirubin.

The earlier history of the development of our knowledge of the origin of bilirubin and the pathogenesis of jaundice, these being clearly separate but closely related problems, is of much interest in its own right. I will do nothing more here than to sketch in a few of the important milestones, but to anyone who would interest himself in the earlier work on these topics, much of which has been too readily forgotten, I would strongly recommend Stadelmann's classic monograph on jaundice published in 1891.[14] Thanks to the generosity of Dr. Henry Ulrich, I am the proud possessor of a Stadelmann, and I have never failed to gain stimulus from reading the pages of his descriptions of the earlier work in this field.

According to Stadelmann, it was Tarchanoff who first proved beyond question that the bilirubin of the bile was derived from hemoglobin, indeed from the pigment fraction of the hemoglobin molecule. Tarchanoff[15] observed striking increa of bile pigment concentration in the bile of dc with bile fistulas, following the intravenous i jection of hemoglobin solutions or of bilirut itself, or following intravascular hemolysis induc by injection of distilled water. Minkowski a Naunyn[16] believed that hemoglobin was convert to bile pigment only in the liver. They work with geese in which the administration arseniuretted hydrogen ordinarily produc jaundice with ease. After removal of the liv jaundice failed to appear. Stern[17] had previou shown that jaundice failed to appear in doves w the common duct ligated, in which the liver h been excluded from the circulation by ligation all of its blood vessels. Stern had concluded fr these experiments "that since exclusion of t liver did not lead to the collection of bile pi ment in the tissues or secretion by the animal, t liver itself must be the site of formation of tl pigment." Minkowski and Naunyn reached similar conclusion with their geese and formulat the dogma "without the liver no jaundice."

With respect to Stern's conclusion, just r ferred to, Stadelmann made the following co servative but prophetic remark: "Can one rea draw a conclusion to such an extent? There w be many careful scholars who will prefer to su stitute" (in Stern's conclusion) "instead animal organism, organism of the bird, and w will raise the objection that the organism of t mammals, especially that of man, may behave in manner entirely different from that of doves This prophecy of Stadelmann was fulfilled McNee, then a young man working in Aschof laboratory in Freiberg, now Sir John McN emeritus professor of medicine in the Univers of Edinburgh. McNee pointed out that in gee the reticuloendothelial system is mainly conce trated in the liver and the spleen is almo rudimentary. Studying experimental hemoly jaundice, he found evidence that conversion hemoglobin to bile pigment was largely limited the liver in geese, but in mammals the spleen a bone marrow assumed much greater significance It remained for Mann and his co-workers to pe form the crucial experiment, namely, total hep tectomy in dogs.[19,20] I can well remember t clarity with which Dr. Mann presented the resu of these beautiful experiments to this society 1927. In brief, they revealed decisively an ext hepatic formation of bilirubin. Quantitative c mination of bilirubin concentrations in the blood and from the spleen and bone marrow showed importance of these tissues for the conversion hemoglobin to bile pigment. This work was idely confirmed, and the participation of extra-patic tissues in the formation of bilirubin was us clearly established.

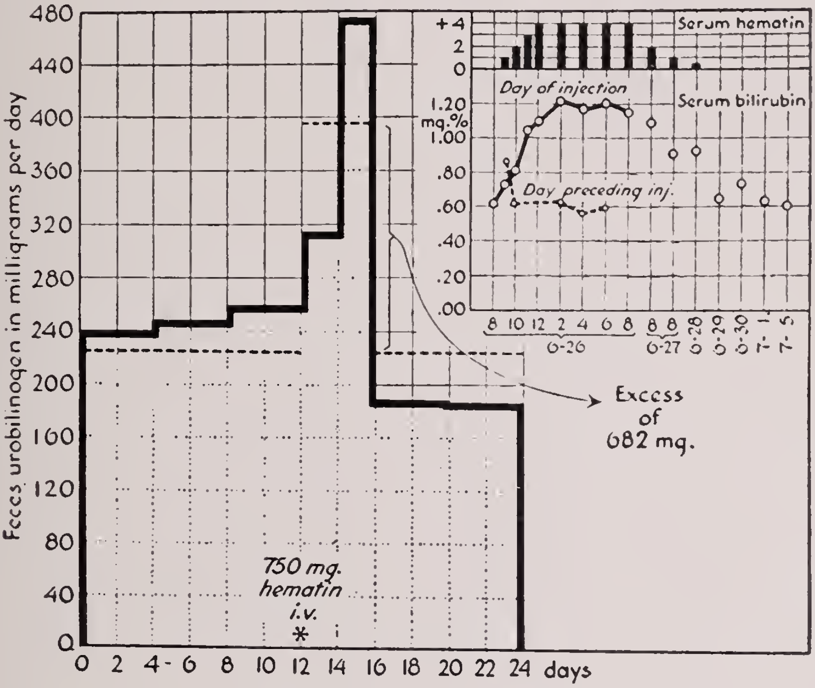


Fig. 4. Increase of serum bilirubin and fecal urobilinogen after intravenous injection of hematin in a normal adult human subject. (From I. J. Pass, S. Schwartz and C. J. Watson, *Journal of Clinical Investigation*, vol. 24, page 284, 1945. Reproduced by permission of the publishers.)

The formulas shown in Figure 3 epitomize the oblem of conversion of the heme in the hemo-obin molecule, to bile pigment. It should be oted that the hemoglobin molecule consists of ur heme nuclei, as shown, for each molecule of obin, the latter comprising about 96 per cent the weight of hemoglobin. We are only con-rned here with the fate of the heme or rosthetic fraction, though, as will be indicated, ere has been some belief that the protein is nportant in controlling the conversion of heme bilirubin.

The exact pathway of this conversion in the ody is still a matter of controversy. In the test ıbe hemoglobin is readily changed to hematin y relatively mild chemical treatment. This in-olves a change of the iron from ferrous to ferric, ith addition of an OH at the iron atom. Thus heme is a ferro-protoporphyrin, hematin a ferri-hydroxide protoporphyrin. The main excretory product of hemoglobin in the gastrointestinal tract is hematin and there is no conversion here to bile pigment. Possibly because of the ease with which hemoglobin is converted to hematin *in vitro,* earlier investigators, notably Brugsch[21] regarded hematin as the first intermediary in the pathway to bile pigment. Brugsch, in fact, was the first investigator to state that the intravenous administration of hematin in dogs with bile fistulas resulted in increased excretion of bilirubin in the bile. This was both confirmed and denied and there is a rather extensive literature on this controversy. The earlier work is well reviewed by Eppinger, 1920.[22] The most recent detailed discussion of the problem is to be found in Torben With's monograph, "The Biology of the Bile Pigments" (1954).[23]

Several observations led to a belief, for a time rather widely held, that hematin is a "blind alley" in hemoglobin metabolism, not converted to bile pigment. In particular this was based on the relatively rare occurrence of cases of "hematin icterus," in other words individuals whose blood serum contained only hematin and no increase in bilirubin.[24,25] Such instances were cited as evidence that hematin is not converted to bilirubin. Cases of this type are, or course, quite inconclusive as one must consider that the hematin may be steadily converted by the liver to bilirubin and that this is at once excreted. In a case of renal trauma and hemorrhage observed years ago in this clinic there was marked hematinemia without increase of the serum bilirubin, yet the feces urobilinogen was greatly increased.[26] While this did not prove that the hematin had been converted to bilirubin and thence to urobilinogen, such an explanation was quite compatible with the data. Subsequent studies with I. J. Pass and S. Schwartz,[27a] in which hematin was injected intravenously in normal individuals, gave clear evidence of a quantitative conversion to bile pigment. As seen in Figure 4, the amount of urobilinogen excreted in the feces agreed very well with expectation on the basis of the amount of hematin injected. Also, a significant rise in serum bilirubin was observed. In recent years this work has been fully confirmed by London[3b] using N_{15} tagged hematin; thus it is difficult to understand why the older studies of Gitter and Heilmeier[28] and of Duesberg[29] failed to reveal evidence of increased bilirubin or urobilinogen formation following injection of hematin. In any event the concept[24] that hematin is a "blind alley" in hemoglobin metabolism rather than an intermediary in the pathway to bilirubin gained wide acceptance because of these observations. For reasons that are not clear, Lemberg[31] was unwilling to accept the belief that hematin is converted to bile pigment, and has been a principal proponent of the view that the first intermediary, rather than hematin, is a "green" hemoglobin or biliverdin-iron globin compound. The first compound of this type to be described was by Fischer and Lindner, [30a] using yeast, but Warburg and Negelein[30b] provided a more exact chemical method by the coupled oxidation of a pyridine hemochromogen with hydrazine, providing what they called a "green hemin." Lemberg[32] later showed that this was a double salt of biliverdin dimethylesterhydrochloride and ferric chloride, differing significantly from Lemberg's "green hemoglobin," the latter being obtained by a coupled oxidation with ascorbic acid.

In essence, the green hemoglobin concept of bile pigment formation as championed by Lemberg, depends upon a primary opening of the protoporphyrin in hemoglobin by oxidative ı moval of the α-methene bridge. The resulting bi verdin is still bound to iron and globin. The fc mation of free bilirubin requires a splitting off iron and globin and the addition of two hydrog atoms to the biliverdin molecule. All of the changes are well within the realm of feasibili but their significance for the natural sequence events is not clear. There is controversy as to t occurrence of green hemoglobins in relation hemoglobin catabolism *in vivo*. Lemberg and c workers,[31,32] Kiese,[33] Engel[34] and other investig tors have reported that circulating red blood ce contain a small amount of a verdohemoglobi but the more recent studies of Kench and asso ates[35,36] cast serious doubt on this concept. Wh anaerobic conditions were employed the amou observed was extremely small and not larger th was obtained on crystallization of oxyhemoglobi Kench believed that these small amounts we probably formed during the isolation procedu and that the natural occurrence of verdohemogl bin in the red cells was doubtful.

While Lemberg and other proponents of the ve dohemoglobin concept regard a continued attac ment to globin as essential for biliverdin formatio Kench's studies clearly reveal that protein is u necessary and that hematin is readily converted bile pigment *in vitro,* under appropriate co ditions. It is true that in their experiments t yield was consistently better when the her (Fe^{++}) or hematin (Fe^{+++}) was combined wi protein, either globin or albumin, but it appear that the sole function of the protein in this rega was the protection of the biliverdin against fu ther oxidation after it was once formed. It w also clear in these experiments that the state the iron in the molecule was unimportant; just good conversion was observed with ferric iron hematin as with ferrous iron in hemoglobin heme. It may also be noted that London[3c] h demonstrated the *in vivo* conversion of N^{15} pr toporphyrin, as well as hematin, to bile pigme Previous studies in this laboratory,[27b] in bile rer fistula dogs, had failed to provide evidence such conversion but admittedly did not exclude Further work is necessary to elucidate the possit significance of protoporphyrin as an intermedia in bile pigment formation, under normal or a normal conditions.

Thus the exact pathway along which hem globin is converted to bile pigment in the mai nlian organism is not yet clear. Bingold and Sh[37] in their recent and latest review of this sject state that "in contrast to the still incompte knowledge of the biosynthesis of hemoglobin ıs possible today to provide an exact statement ato the biochemistry of hemoglobin catabolism." th all of the recent evidence in mind, especially t exact knowledge of the biosynthesis of protophyrin gained in the classic studies of Shemin l co-workers, and despite the optimism of Bind and Stich, one is inclined to the belief that t opposite is more nearly correct and that our sent knowledge of anabolism is more exact than at of catabolism. If, as according to Bingold d Stich, one accepts without question the Lemrg concept that the pathway *in vivo* is solely via green hemoglobin and that hematin is not an ermediary under any circumstances, one may quire a sense of security such as evidenced in eir statement, quoted above. Yet a careful exnination of the evidence makes one realize that is may be incorrect. The objection that hemah is never observed under normal circumstances, ut only in the presence of hemolysis and especially molysis associated with liver injury, in no way oves that hematin is not formed as a normal termediary and at once converted to bilirubin ther in the liver alone, as Aschoff[38] assumed, or ore widely, throughout the reticuloendothelial stem. It should be emphasized that Mann and o-workers[20b] regularly observed hematin at the utset of increased bilirubin formation in extraepatic sites and definitely regarded it as a normal ıtermediary between hemoglobin and bilirubin.

Earlier observations with I. J. Pass in this laboratory[26] indicated that epithelial specialization of ells is associated with a diminished production of he ferment necessary to bilirubin formation when emoglobin is extravasated. In such areas hematin vas often encountered without bilirubin whereas n spaces lined by mesenchymal cells bilirubin was often encountered without hematin, following extravasation of blood. These observations, however, permit two interpretations: one, that the epithelial cells do not have the ability of further conversion of hematin to bilirubin while the mesenchymal cells do; the other, that the epithelial cells convert hemoglobin to hematin, the mesenchymal cells hemoglobin to bilirubin, without hematin as an intermediary. The presence of hemoglobin, hematin and bilirubin in some fluids may perhaps be somewhat more indicative of the former possibility. It should be noted that the conversion of hematin to bilirubin may well proceed over a verdohematin analogous to the "green hemoglobin." It is quite possible that both pathways are included in the natural sequence of events, variations in emphasis depending on as yet unknown factors.

References

1. Shemin, D., and Rittenberg, D.: The biological utilization of glycine for the synthesis of the protoporphyrin of hemoglobin. J. Biol. Chem., 166:621, 1946.
2. Shemin, D., and Wittenberg, J.: The mechanism of porphyrin formation. The role of the tricarboxylic acid cycle. J. Biol. Chem., 192:315, 1951.
3. (a) London, I. M.; West, R.; Shemin, D., and Rittenberg, D.: On the origin of bile pigment in normal man. J. Biol. Chem., 184:351, 1950. (b) London, I. M.: The conversion of hematin to bile pigment. J. Biol. Chem., 184:373, 1950. (c) London, I. M.; Yamasaki, M., and Sabella, G.: Conversion of protoporphyrin to bile pigment. Fed. Proc., 10:217, 1951.
4. (a) Waldenström, J., and Vahlquist, B.: Studien über die Entstehung der roten Harnpigment (Uroporphyrin und Porphobilin) bei der akuten Porphyrie aus ihrer farblosen Vorstufe (Porphobilinogen). Ztschr. physiol. Chem., 260:189, 1939. (b) Westall, R. G.: Isolation of porphobilinogen from the urine of a patient with acute porphyria. Nature, 170:614, 1952.
5. Cookson, G. H., and Rimington, C.: (a) Porphobilinogen: chemical constitution. Nature, 171: 875, 1953. (b) Porphobilinogen. Biochem. J., 57:476, 1954.
6. Shemin, D., and Russell, C. S.: σ-Amino levulinic acid: its role in the biosynthesis of porphyrins. J. Am. Chem. Soc., 75:4873, 1953.
7. Neuberger, A., and Scott, J. J.: Aminolaevulic acid and porphyrin biosynthesis. Nature: 172: 1093, 1953.
8. Rimington, C.: Porphyrins. Endeavour, 14:126, 1955.
9. Salomon, K.; Richmond, J. E., and Altman, K. I.: Tetrapyrrole precursors of protoporphyrin IX: I. Uroporphyrin III. J. Biol. Chem., 196:463, 1952.
10. Bogorad, L., and Granick, S.: The enzymatic synthesis of porphyrins from porphobilinogen. Proc. Nat. Acad. Sc., 39:1176, 1953.
11. (a) Falk, J. E.; Dresel, E. I. B., and Rimington, C.: Porphobilinogen as a porphyrin precursor, and interconversion of porphyrins, in a tissue system. Nature, 172:292, 1953. (b) Schwartz, S.: In Porphyrin Biosynthesis and Metabolism. Ciba Foundation Symposium. London: J. and A. Churchill, Ltd., 1955, p. 296.
12. Virchow, R.: Die pathologischen Pigmente. Arch. f. path. Anat., 1:379, 1847.
13. Fischer, H., and Reindel, F.: Über Hämatoidin. Ztschr. f. physiol. Chem., 127:299, 1923.
14. Stadelmann, E.: Der Ikterus und seine verschiedenen Formen. Stuttgart: F. Enke, 1891.
15. Tarchanoff, J. F.: Über die Bildung von Gallenpigment aus Blutfarbstoff im Thierkörper. Arch. f. d. ges. Physiol., 9:53, 1874.
16. Minkowski, O.: Beiträge zur Pathologie der Leber und des Icterus. 3. Über den Einfluss der Leberexstirpation auf den Stoffwechsel. Arch. f. exper. Path., 21:41, 1886.
17. Stern, H.: Beiträge zur Pathologie der Leber und des Icterus. 1. Über die normale Bildungsstätte

des Gallenfarbstoffes. Arch. f. exper. Path., 19:39, 1885.

18. McNee, J. W.: Experiments on hemolytic icterus. J. Path. & Bact., 18:325, 1924.
19. Mann, F. C.; Bollman, J. L., and Magath, T. B.: Studies on the physiology of the liver. Formation of bile pigment after total removal of the liver. Am. J. Physiol., 69:393, 1924.
20. (a) Mann, F. C.; Sheard, C.; Bollman, J. L., and Baldes, E. J.: The site of the formation of bilirubin. Am. J. Physiol., 74:497, 1925. (b) Mann, et al: The formation of bile pigment from hemoglobin. Am. J. Physiol., 76:306, 1926.
21. Brugsch, T., and Kawashima, K.: Der Einfluss von Hämatoporphyrin, Hämin und Urobilin auf die Gallenfarbstoffbildung. Ztschr. f. exper. Path., 8:645, 1911.
22. Eppinger, H.: Die hepatolienalen Erkrankungen. Berlin: J. Springer, 1920.
23. With, T.: The Biology of the Bile Pigments. Copenhagen: Arne Frost-Hansen, 1954.
24. Bingold, K.: Blutstoffwechsel. In Hirschfeld, H., and Hittmair, A. C.: Handbuch d. allg. Haematol. Bd. I, erste Hälfte, 601. Berlin: Urban & Schwarzenberg, 1932.
25. Duesberg, R.: Über die biologischen Beziehungen des Hämoglobins zu Bilirubin und Hämatin bei normalen und pathologischen Zuständen des Menschen. Arch. f. exp. Path. u. Pharm., 174: 305, 1934.
26. (a) Watson, C. J.: The pyrrol pigments with particular reference to normal and pathologic hemoglobin metabolism. Downey's Handbook of Hematology, v. IV, 2447. New York: P. Hoeber, 1938. (b) Watson, C. J.: Some newer concepts of the natural derivatives of hemoglobin. Blood, 1:99, 1946.
27. (a) Pass, I. J.: Schwartz, S., and Watson, C. J.: The conversion of hematin to bilirubin following intravenous administration in human subjects. J. Clin. Invest., 24:283, 1945. (b) Watson, C. J.; Pass, I. J., and Schwartz, S.: A study of the supposed conversion of protoporphyrin to coproporphyrin by the liver. I. The fate of parenterally administered protoporphyrin in dogs with bi renal fistulae. J. Biol. Chem., 139:583, 1941.
28. Gitter, A., and Heilmeyer, L.: Klinische Far messungen. Der Einfluss parenteraler Gaben vc Hämoglobin und Hämoglobinabbauprodukten a den Blutfarbstoffwechsel mit besonderer Berüc sichtigung der Harnfarbstoffausscheidung. Ztsch f. d. ges. exper. Med., 77:597, 1931.
29. Duesberg, R.: Über den Auf-und Abbau d Blutfarbstoffes. Klin. Wchnschr., 17:1353, 1938
30. (a) Fischer, H., and Lindner, F.: Über den Umb des Blutfarbstoffes durch Hefe I Mitteil. Ztsch f. physiol. Chem., 153:54, 1926. (b) Warburg, O. and Negelein, E.: Grün Hämin aus blut-Hämin. Ber. deutsch. Chem. G sellsch., 63:1816, 1930.
31. Lemberg, R., and Legge, J. W.: Haematin co pounds and bile pigments. New York and Londo Interscience, 1949.
32. Lemberg, R.; Lockwood, W. H., and Legge, W.: Coupled oxidation of ascorbic acid an haemoglobin. 5. Studies on the formation of bi pigments from choleglobin and on their isolatio from erythrocytes. Biochem. J., 35:363, 1941.
33. Kiese, M.: Verdoglobine beim Abbau von Häm globin im Organismus Naturwissensch. 30:58 1942.
34. Engel, M.: Die heutigen Vorstellungen über de Blutfarbstoffabbau zu Gallenfarbstoff. Kli wchnschr., 19:1177, 1940.
35. Gardikas, C.; Kench, J. E., and Wilkinson, J. F Bile pigment formation *in vitro* from haematin an cytes. Biochem. J., 46:85, 1950.
36. Kench, J. E.; Gardikas, C., and Wilkinson, J. F Bile pigment formation in vitro from haematin an other haem derivatives. Biochem. J., 47:12 1950.
37. Bingold, K., and Stich, W.: Fortschritte auf de Gebiet des Blutfarbstoffes. Ergeb. d. inn. Me u. Kinderheilk., Neue Folge, 5:707, 1954.
38. Aschoff, L.: Über Bildungs—und Ausscheidun störungen der gallenfähigen Substanzen (Dyscholie besonders des Gallenfarbstoffes (Ikterus). Act path. et microbiol. scandinav., 5:339, 1928.

(To be continued in June issue)

THE POSITION OF RADIOLOGY IN CARDIOVASCULAR DIAGNOSIS

(Continued from Page 280)

evidence of pulmonary sequestration by demonstrating the anomalous vascular supply to a segment of lung from the aorta directly. The method is useful as well in demonstrating arteriovenous communications in lung (Fig. 11) and to differentiate between gross cardiac dilatation and pericardial effusion. It has been used with profit to study pulmonary neoplasms.

The present position of radiology in cardiovascular diagnosis is one of major importance and each month that position is broadened and strengthened. In this field close co-operation with the specialties of cardiology and surgery is mandatory if the full benefits of angiography are to b realized. The haphazard employment of the ne and complex methods is not to be recommende and the most glittering radiographic images are c little value until they have been thoroughly an expertly analyzed. The required apparatus costly and highly specialized, but the great valu of the diagnostic results to be expected justifie the capital investment and the detachment of abl radiologists from other endeavors to devote them selves to this type of work and the further advanc of knowledge. The future of cardiovascular ra diology appears to be brilliant and assured.

Continuation Studies

ACTURES OF THE METACARPALS, METATARSALS ND PHALANGES

LESTER W. CARLANDER, M.D.
Minneapolis, Minnesota

Fractures of the metacarpals and phalanges of hand and metatarsals and phalanges of the t are very common problems with which we have to deal. Although these are not consid- d major fractures, the proper handling of them ds to a much happier patient and a quicker d more complete functional rehabilitation of e injured parts.

Fractures of the phalanges of the toes are com- on and of importance largely only because of eir nuisance quality. Most of these fractures can successfully treated by reassurance and by the e of proper foot wear. This involves the use of stiff sole (largely preventing motion in the toes curred in walking) and relief from pressure on p of the toe from the upper portion of the shoe ring the period which the toe may be swollen d painful. The use of traction can probably ell be reserved for displaced fractures extending to the articular surface at the metatarsal- alangeal articulation, particularly in the great e.

The metatarsal bones of the foot tend to splint ne another quite securely so that they do not sually become greatly displaced when fractured xcept with severe injuries. Treatment again can equently be accomplished by the use of a stiff led shoe with reinforced shank and proper longi- dinal and anterior arch supports. At times reater comfort can be obtained by the use of a ell applied short boot cast molded carefully be- eath the foot and application of a walking heel.

The frequently seen avulsion type fracture at he base of the fifth metatarsal may go on to brous union when displaced but is seldom symp- omatic. In children, confusion with the epiphy- is present at the base of the fifth metatarsal should e avoided. This will be bilateral and smooth. There is present in some feet a separate ossicle n this area, the os vesalianum, which again is sually bilateral and smooth.

The possible occurrence of "march" or "stress" fractures of the metatarsals is generally well known today. The rather spontaneous nature of this fracture or the appearance of callus or new bone involved in healing should not lead to consideration of biopsy nor amputation for bone tumor.

Avoidance of over-treatment of fractures of the foot may help to decrease the occasional prolonged rehabilitation seen with the development of painful osteoporosis.

In contradistinction to the toes, the function of the fingers is of extreme importance; and treatment of fractures of the phalanges in the hand is aimed toward the early re-establishment of this high degree of functional capacity. In general, splinting of fractures in the hand should be accomplished in functional position, this being the position of partial flexion. Tongue blade splinting is to be avoided. Splinting should be maintained only for that period necessary to allow sufficient healing to insure stability of the fractured fragments. Active motion may then be started to prevent undue stiffening of the metacarpal-phalangeal and interphalangeal articulations.

Fractures of the distal phalanx will usually merely require protection, particularly when the finger nail is intact. Fractures of the middle and proximal phalanx may require traction in order to prevent shortening and to maintain alignment. This traction may be either skeletal or occasionally skin traction. Traction should be applied over a curved splint, and the fact that each finger flexes in a different axis of rotation at the metacarpal-phalangeal articulation should always be remembered. Fractures extending into the joint at the base of the second and third phalanges are particularly troublesome and tend to give a broad and partially subluxated joint unless traction is maintained until good healing is present.

Fractures of the neck of the metacarpals are frequently seen particularly in the fifth and fourth metacarpals. Because of the nature of the fracturing force, the head is usually tipped forward into the palm and this palmar prominence of the head must be corrected in order to prevent a pressure point which may afterwards be bothersome in gripping. This angulation can usually be corrected by manipulative pressure using the flexed proximal phalanx to push against the palmar surface of the head of the metacarpal. In fractures of the shafts of the metacarpals, rotation deformities must again be considered and can be prevented by accomplishing reduction with the fingers flexed at the metacarpal-phalangeal joint and in apposition to one another.

Special attention should also again be called to the fracture at the base of the first metacarpal in the thumb which extends into the joint and allows a subluxation or dislocation of the main metacarpal fragment. This is called Bennett fracture. It is important that these fractures b maintained with complete abduction of the fir metacarpal, and as it is an unstable fracture, frequently slipping after reduction, traction on th abducted thumb is usually necessary. It is important that frequent radiographic checks be use in the first two weeks following reduction to se that position is maintained.

A word should be said about the use of Kirschner wires in the treatment of fractures of th metacarpals and phalanges. Fine Kirschner wire are frequently of great benefit in the treatmer of these fractures and may at times allow earl use of other portions of the hand.

By reviewing these injuries it is hoped that th reader may facilitate the care and rehabilitatio of these common fractures.

GALACTOSEMIA

The cause of an often fatal metabolic disease of children has been discovered by scientists of the Public Health Service's National Institute of Arthritis and Metabolic Diseases, according to Surgeon General Leonard A. Scheele.

Drs. Herman M. Kalckar, Elizabeth P. Anderson, and Kurt J. Isselbacher, in work conducted at the National Institutes of Health, Bethesda, Maryland, have unraveled much of the mystery surrounding the little understood children's disease, galactosemia, also known as galactose diabetes.

This disease ordinarily appears within a few days after birth. The infant suffering from galactosemia is unable to utilize or even tolerate milk in any form. Lactose, often called milk sugar, contains another sugar, galactose. This substance cannot be handled by the child's system if he has galactosemia.

The Institute scientists have discovered a hitherto unknown enzyme in normal red blood cells, which they call P-Gal transferase. This enzyme, they found, is necessary to complete conversion in the body of galactose into glucose, the common sugar of the blood.

Diagnosis of galactosemia is difficult because the symptoms are similar to those of other disorders. Diarrhea, lack of appetite, loss of weight, and jaundice appear in the earlier stages. In later stages, it leads to cirrhosis of the liver, mental retardation, blindness du to cataract, and death.

Early recognition of galactosemia is highly importan since the disease progresses rapidly, leaving serious irreversible changes. On the other hand, when diagnose in an early stage, treatment is simple. The affecte child, placed promptly on a milk-free diet, will grow and develop normally.

The discovery of the basic cause of the disease promise to provide a rather simple diagnostic test, making earlie life-saving treatment possible.

Scientists at the Institute became interested in th disease when research workers in Manchester, Englanc reported certain abnormalities in the red blood cells o infants with galactosemia. Their own work has reveale that the enzyme, P-Gal transferase, which they had foun in normal blood, was missing in the blood of childre with this disease, and that this inherited metabolic defec was the basis of the disorder. A report on their researc is published in a recent issue of the Proceedings c the National Academy of Sciences.

Knowledge of P-Gal transferase not only makes possible the development of a rather simple diagnostic tes for galactosemia, but it also points the way to exploration of the distinct possibility that impairments i galactose metabolism may be a factor in other disorde of unknown origin.

Now Available

7 Years Sickness Benefits

(HOUSE CONFINEMENT NOT REQUIRED)

Lifetime Accident Benefits

This extension of benefits is now available to you as a member of the Minnesota State Medical Association. Since December, *1947,* the inception date of our plan for members of your Association, the Caswell-Ross Agency has attempted at all times to secure for you the finest coverage in the accident and sickness field. These improvements will make your policy the best among many available to you. An application has been sent to you previously—why not complete and return it to our office now.

CASWELL-ROSS AGENCY

1177 N. W. Bank Building Minneapolis 2, Minnesota
Minneapolis—FE 2-2585 St. Paul—MI. 5-7004

Administrators of Professional Disability Plans

Minnesota State Bar Association
Minnesota State Dental Association
Minnesota Society of C. P. A.
Minnesota State Pharmaceutical Assn.
Minnesota Auto Dealers Association
Minnesota Federation of Eng. Societies
Minnesota State Veterinary Medical Soc.
Hennepin County Medical Society
Hennepin County Bar Association
11th Judicial Bar Association
Minneapolis Association of Life Underwriters
Minnesota State Life Underwriters Assn., Inc.
Ramsey County Medical Society
Ramsey County Bar Association
St. Paul District Dental Soc.
Minneapolis District Dental Soc.
St. Cloud Dental and Stearns County Medical Society
Duluth District Dental Society
East Central Medical Society
St. Louis County Medical Society
West Central Dist. Dental Society
Northwest Proprietors Association
St. Paul Life Underwriters, Inc.

TRANS WORLD AIRLINES
TWA

HORN & HARDART
RESTAURANT

ACHROMYCIN*

Tetracycline *Lederle*

in the treatment of

respiratory infections

January and his associates[1] have written on the use of tetracycline (ACHROMYCIN) to treat 118 patients having various infections, most of them respiratory, including acute pharyngitis and tonsillitis, otitis media, sinusitis, acute and chronic bronchitis, asthmatic bronchitis, bronchiectasis, bronchial pneumonia, and lobar pneumonia. Response was judged good or satisfactory in more than 84% of the total cases.

Each month there are more and more reports like this in the literature, documenting the great worth and versatility of ACHROMYCIN. This antibiotic is unsurpassed in range of effectiveness. It provides rapid penetration, prompt control. Side effects, if any, are usually negligible.

No matter what your field or specialty, ACHROMYCIN can be of service to you. For your convenience and the patient's comfort, Lederle offers a *full* line of dosage forms, including

ACHROMYCIN SF

ACHROMYCIN with STRESS FORMULA VITAMINS. Attacks the infection—defends the patient—hastens normal recovery. For severe or prolonged illness. Stress formula as suggested by the National Research Council. Offered in Capsules of 250 mg. and in an Oral Suspension, 125 mg. per 5 cc. teaspoonful.

For more rapid and complete absorption. Offered only by Lederle!

dry-filled sealed capsules

---

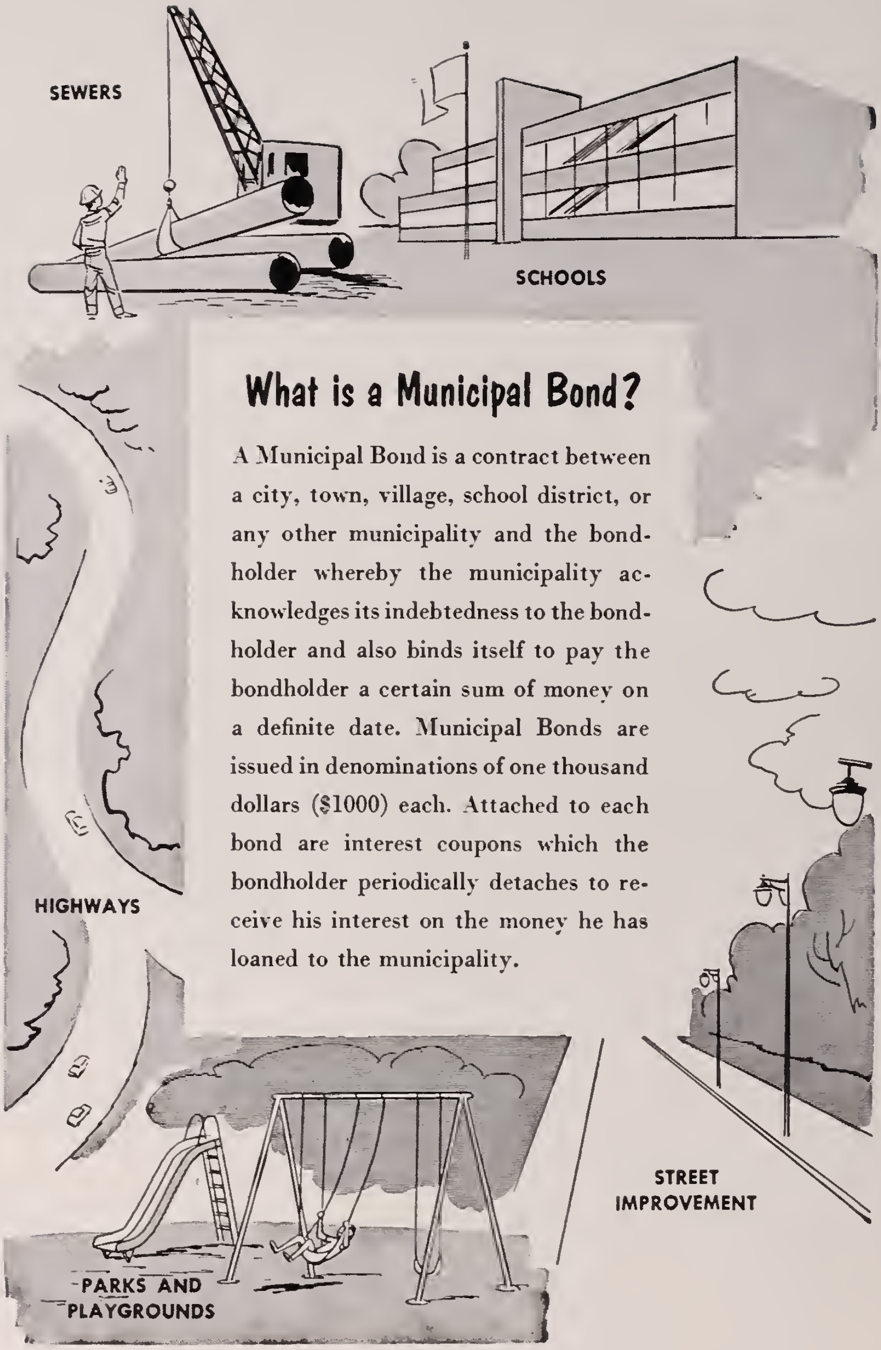
[1] January, H. L. et al: Clinical experience with tetracycline. *Antibiotics Annual* 1954-55, p. 625.

Lederle

LEDERLE LABORATORIES DIVISION
AMERICAN CYANAMID COMPANY
PEARL RIVER, NEW YORK

*REG. U. S. PAT. OFF.

PHOTO DATA: 4X5 VIEW CAMERA, F5.6, 1/25 SEC., EXISTING LIGHTING AT DUSK, ROYAL PAN FILM.



What is a Municipal Bond?

A Municipal Bond is a contract between a city, town, village, school district, or any other municipality and the bondholder whereby the municipality acknowledges its indebtedness to the bondholder and also binds itself to pay the bondholder a certain sum of money on a definite date. Municipal Bonds are issued in denominations of one thousand dollars ($1000) each. Attached to each bond are interest coupons which the bondholder periodically detaches to receive his interest on the money he has loaned to the municipality.

Reprinted from "Municipal Bonds and You" our colorful sixteen-page book that is available to you Free!

Name________________________________

Address______________________________

City____________________ State________

MM-5-6

JURAN & MOODY, INC.

Municipal Bonds Exclusively

Rand Tower
MINNEAPOLIS 2

93 East 6th St.
ST. PAUL 1
TELEPHONE: CApital 4-9661

Citizens and Southern Build
ATLANTA, GA.

urrent Concepts

AGNOSIS AND TREATMENT OF THROMBOANGIITIS OBLITERANS UERGER'S DISEASE)

NELSON W. BARKER, M.D.
Rochester, Minnesota

Thromboangiitis obliterans is a segmental in- nmatory obliterating disease of the arteries d veins of the extremities that tends to produce hemia of tissues and occasionally gangrene. It urs almost exclusively in young and middle- ed men. Typical lesions rarely occur in the cera but patients who have the disease also ve a somewhat increased tendency to undergo clusion of the coronary, cerebral and mesenteric eries later in life as the result of atherosclerosis, different pathologic process.

The exact cause of thromboangiitis obliterans is t known. However, available evidence indi- tes that the most important factor in almost persons in whom the disease develops is a culiar individual susceptibility of the vessels of e extremities to endothelial injury as the result absorption of some product in tobacco smoke.

Diagnosis

The ultimate criterion for the diagnosis of romboangiitis obliterans is a rather typical his- pathologic picture found in the affected vessels; ese characteristic changes include endothelial oliferation, occlusion of the lumen by a throm- is, extremely cellular organization of the throm- is and diffuse panangiitis without necrosis or struction of the medial coat. Not found are sub- dothelial atheromatous lesions containing fat d cholesterol or subendothelial or medial calci- ation. Primarily, the lesions affect small and edium-sized arteries, such as the posterior tibial, terior tibial and major digital arteries. In dition, veins accompanying these arteries and perficial veins of comparable size are frequently fected. The disease almost never begins in large arteries, such as the femoral and iliac, but occasionally it progresses into them from more distal branches.

The diagnosis of thromboangiitis obliterans almost always can be made clinically and without resorting to arterial biopsy. In making the diagnosis, it is important to remember that thromboangiitis obliterans is only one of several diseases that may produce ischemic manifestations in one or more extremities. It is most likely to be confused with arteriosclerosis obliterans. Sometimes, but less commonly, it is confused with peripheral arterial embolism, simple arterial thrombosis, scleroderma (acrosclerosis), Raynaud's disease, ergotism and arterial occlusions due to acute or chronic occupational trauma. In making the diagnosis of thromboangiitis obliterans, it is first necessary to establish the fact that occlusive arterial disease exists in one or more of the extremities.

Intermittent Claudication.—Intermittent claudication is an almost pathognomonic symptom of occlusive arterial disease. The currently accepted definition of intermittent claudication is a pain, ache, tightness, or sense of abnormal fatigue felt in the region of certain groups of muscles in the extremities that is never present during rest, develops only after a period of sustained exercise of the muscles and is relieved rather promptly by rest without change of position. Intermittent claudication is not a disease. It is a symptom and it indicates only the presence of some type of occlusive arterial disease. It may occur as the result of thromboangiitis obliterans, arteriosclerosis obliterans, arterial embolization or simple arterial thrombosis. In thromboangiitis obliterans, it may occur in the calf or in the arch of the foot, where it may be mistakenly attributed to mechanical derangements of the foot and arch. Intermittent claudication in the thigh or hip is rarely

---

From the Section of Medicine, Mayo Clinic and Mayo undation.

The Mayo Foundation, Rochester, Minnesota, is a rt of the Graduate School of the University of Minne- ta.

seen in thromboangiitis obliterans. Other types of pain that may occur in cases of more advanced chronic occlusive arterial disease in which the evidence of ischemia in the affected extremity is more obvious are rest or pretrophic pain in digits, pain associated with ulcers or gangrene and pain associated with ischemic neuropathy of major nerve trunks.

Arterial Pulsations.—The objective manifestations of chronic occlusive arterial disease are impairment or absence of pulsations in one or more of the major arteries of the extremities and, in advanced disease, abnormal pallor of one or more of the extremities on elevation, with delay in the return of color and in filling of superficial veins on dependency after elevation. Also, there may be abnormal and persistent coldness of one or more of the extremities or of one or more individual digits, persistent bluish or reddish discoloration of one or more digits, and gangrene or ulceration of one or more digits or parts of the foot.

In examination for impairment or absence of arterial pulsations, the brachial arteries, antecubital arteries, radial and ulnar arteries at the wrist, femoral arteries in Scarpa's triangle, popliteal arteries, posterior tibial arteries behind the internal malleoli and dorsalis pedis arteries should be palpated. However, impairment or absence of pulsations in one or both dorsalis pedis arteries is not necessarily significant of occlusive arterial disease, since these arteries are small or absent as the result of developmental anomaly in about 5 per cent of normal persons. Impairment or absence of pulsations in the posterior tibial arteries, however, is almost certainly indicative of chronic occlusive arterial disease. If the diagnosis of occlusive arterial disease has been established by objective examination, it is almost always possible to determine clinically the nature of the underlying arterial disease.

Other Diseases.—Raynaud's syndrome, or transient blanching of one or more of the digits on exposure to cold, may occur in thromboangiitis obliterans. The involvement of the digits is almost always asymmetric, whereas in true Raynaud's disease the involvement is usually symmetric. Arterial pulsations are not impaired or absent in true Raynaud's disease. The occurrence of sclerodactylia or scleroderma associated with Raynaud's syndrome indicates the presence of acral scleroderma (acrosclerosis), not throm angiitis obliterans.

Ergotism is comparatively rare in this coun except when the patient has taken or been gi medicine containing ergot or its derivatives. chemia of the extremities produced by ergotism almost always symmetric, whereas it is alm always asymmetric in the other chronic occlus arterial diseases. If arterial occlusion is due arterial embolism, there will almost always coexistent serious cardiac disease in the form recent myocardial infarction, auricular fibrillat or subacute bacterial endocarditis. Also, the or of the ischemic manifestations produced by em lization of the extremity almost always will h been marked by sudden arterial occlusion, wher sudden occlusion of large arteries is not common thromboangiitis obliterans. Simple or essential terial thrombosis is rare and usually is associa with polycythemia vera, severe infectious disease advanced malignant neoplasms. When none these are present, the diagnosis of simple arte thrombosis should be made with great cauti

Thromboangiitis Obliterans Versus Arterioscl rosis Obliterans.—The two commonest chronic clusive arterial diseases are thromboangiitis ob erans and arteriosclerosis obliterans. Some di culty may be encountered at times in differenti ing these two conditions, although the clini features now to be mentioned usually permit su distinction. Thromboangiitis obliterans almost ways produces its first clinical manifestations fore the age of forty years, whereas arterioscler obliterans usually appears after the age of fo There are a few exceptions to this rule, howev and patients who experience the first signs ischemia in an extremity between forty and fi years of age may have either disease. Throm angiitis obliterans is rare in women (1 per cer whereas about 15 to 20 per cent of cases of arte sclerosis obliterans occur in women. The prese of definite signs of ischemia in one or both ha associated with similar manifestations in the lo extremities is strong evidence in favor of throm angiitis obliterans, since such ischemic manife tions are almost unknown in the upper extremi of patients who have arteriosclerosis obliter A good history of thrombophlebitis or the act presence of the lesions of superficial thrombop bitis in small veins in association with occlus arterial disease occurs in about 40 per cent tients who have thromboangiitis obliterans but actically never is noted in arteriosclerosis literans.

The following are almost certain indications that e disease in question is arteriosclerosis obliterans her than thromboangiitis obliterans: (1) roent-ographically demonstrable calcification in the noral or iliac arteries; (2) the presence of dia-tes mellitus; (3) increased values for plasma olesterol and total lipides and (4) a systolic bruit ard over a femoral or iliac artery or over the dominal aorta. In the age group in which there most likely to be a question as to the differen-tion of thromboangiitis obliterans and arterio-erosis obliterans, absence of pulsations in pop-al and femoral arteries is much less common in romboangiitis obliterans except when the dis-se has been present for a considerable period, th gradual progression.

Treatment

Thromboangiitis obliterans is characterized by acerbations when new segments of arteries be-me occluded and remissions when there is slow velopment of collateral circulation around the cluded segments. The most important feature in e treatment is absolute insistence on abstinence om tobacco smoking. If the patient completely scontinues smoking, exacerbations of the disease e almost unknown. If the diagnosis is made rly in the course of the disease and if the patient ops smoking, the collateral circulation may de-lop to a point at which all symptoms and signs sappear other than absence of pulsations in some the arteries.

General Measures.—An important part of the anagement of patients who have thromboangiitis literans is instruction regarding care of the feet d hands and avoidance as far as possible of any inor or major injury to them, whether it be of echanical, chemical, or thermal origin. As in all nditions associated with chronic ischemia of an tremity, most instances of gangrene or ischemic ceration develop as the result of some minor d avodiable trauma, such as pressure on toe-ils from ill-fitting shoes, cuts or bruises, over-eatment of fungous infection or ill-advised treat-ent of corns, calluses or ingrown toenails. Major even minor surgical operations on the feet or es should never be undertaken in any patient ntil it has been determined that ischemia or evidence of occlusive arterial disease is absent; if signs of such disease are found, the surgical procedure should be deferred in almost all instances. The local application of strong chemicals should be avoided. Patients who have thromboangiitis obliterans should be warned to avoid exposure to cold, since even a minimal degree of such exposure sometimes may result in frostbite in an ischemic extremity. Also, they should be warned not to use any hot dry objects, such as hot-water bottles or electric pads, to warm an ischemic extremity. Unfortunately, many patients with thromboangiitis obliterans do not come under the care of a physician until the disease is well advanced. In these patients, considerable permanent damage already may have been done to the arterial system in one or more extremities, and the complications of ischemic ulceration or gangrene already may have occurred.

Patients who have ulcerative or gangrenous lesions should be treated in the hospital and should be kept off their feet in a warm room (75 to 80° F.). Only bland topical applications should be used on the lesions. The use of warm soaks with a solution of boric acid for 20 to 30 minutes two to four times a day, with application of simple dry dressings between soaks, constitutes a simple and safe local treatment. When gangrenous tissue has sloughed and residual ulcers are relatively clean, the use of powdered erythrocytes may expedite healing. In general, ulcers and gangrenous lesions should be undertreated rather than overtreated, since many local preparations and ointments that would be harmless when used in the absence of ischemia may aggravate and cause extension of lesions when ischemia does exist.

Local infection in the surrounding tissues almost always is associated with gangrenous and ulcerative lesions, and the organism usually responsible for this infection is Micrococcus pyogenes (Staphylococcus). Oral or parenteral antibiotic therapy may be of considerable value in eliminating these local infections, thus giving the tissues a better chance to heal. The most effective current antibiotic against the largest number of strains of M. pyogenes should be used unless it is possible to obtain the specific organism by culture and determine its sensitivity to various antibiotics.

Surgical Treatment.—Regional surgical sympathetic ganglionectomy is of value in many patients who have thromboangiitis obliterans and contraindications to this procedure rarely exist. The operation is not necessary when the disease is mild and early and is associated with minimal evidence of digital ischemia, whereas the procedure is futile in the presence of advanced ischemia, with extensive gangrene extending into the foot. When gangrene is confined to one or more digits, it is usually advisable to wait until evidence of progression has stopped before sympathetic ganglionectomy is done. Sympathectomy is indicated in most cases of moderate ischemia with or without minor ulcerative or gangrenous lesions. The use of various drugs for the production of vasodilatation is not often of value and is distinctly inferior to sympathetic ganglionectomy.

When mass gangrene of digits or portions of digits exists, surgical intervention should not be attempted until all evidence of local infection and inflammation around the line of demarcation has disappeared. Even then it is usually best to wait and allow the gangrenous tissue to slough spontaneously, but in some instances healing may be expedited by gentle débridement through the line of demarcation. Amputation of the entire toe through its base occasionally may be advisable; when this is undertaken, it should be always recognized that healing may be delayed and that more gangrene may develop at the site of amputation. Even in patients who have severe and persistent pain with gangrenous lesions, amputation of a leg should be delayed as long as possible. If smoking is stopped and unless the gangrene extends into the distal part of the foot, the lesions usually w heal ultimately. When gangrene extends into th foot, the ultimate survival of a useful foot unlikely and amputation through the midcalf almost always necessary.

Currently, surgical excision of occluded segmen of arteries with replacement by arterial homograf or prosthetic tubes is not practical in thromboa giitis obliterans because of the small size of th involved arteries and the multiplicity of the o cluded segments.

Summary

Thromboangiitis obliterans is a specific disea entity but it is only one of several occlusive arter diseases that involve extremities. The diagno almost always can be made clinically and t condition usually can be distinguished from oth chronic occlusive arterial diseases, including art riosclerosis obliterans, which is a somewhat mo common disorder.

The treatment of thromboangiitis oblitera consists of complete abstinence from smoking t bacco, careful protection of involved extremit against major and minor chemical, mechanic and thermal trauma, regional sympathetic gangli nectomy in most cases, conservative local trea ment and antibiotic therapy for ischemic ulcer tive and minor gangrenous lesions, and conserv tive amputation or débridement for mass gangre of digits.

CHRONIC PYURIA

(Continued from Page 284)

In some cases an infection will clear with a particular antibiotic, only to recur as soon as it is stopped. Here one should reinstitute the original treatment until the urine clears, then gradually reduce the dose in an effort to ascertain the minimum which will keep the urine clear without harming the patient. One such patient of mine has taken one 250 milligram capsule of aureomycin daily since it first became available, without any ill effects; if he stops it, his urine clouds up at once. Since he has large bilateral hydronephroses which preceded a successful transurethral resection, this suggests the potential usefulness of this regimen.

A method used at the Mayo Clinic in similar circumstances involves giving the agent which h been found to be capable of clearing the urine one week of each month.

Careful application of the principles outlined i this presentation will control the majority of u nary infections one should not hesitate to rep any indicated part of the investigation to make su that nothing has been overlooked. A few w persist regardless of the methods used to com them; in the present state of our knowledge must await the development of new agents. F tunately, some of these patients will survive, parently unharmed, for many years especially f the kidneys do not become involved.

ublic Health

IAGNOSTIC STANDARDS AND LASSIFICATION OF TUBERCULOSIS

E. A. MEYERDING, M.D.
Saint Paul, Minnesota

The tenth edition of *Diagnostic Standards and assification of Tuberculosis,* published by the tional Tuberculosis association, has recently en distributed to Minnesota physicians, medical udents and public health nurses by the Minne- ta Tuberculosis and Health Association.

Designed to bring the reader up to date in sev- al fields, the new edition is the result of almost o years of work by an American Trudeau So- ety committee headed by William Spencer hwartz of the Veterans Administration Hospital, teen, North Carolina.

In a revision of the clinical classification of pul- onary tuberculosis, the term "arrested" has been opped and the nomenclature confined to "inac- ve," "active," and "activity undetermined." A ction on the diagnosis of nonpulmonary tuber- ulosis and a section on fungi pathogenic for man ave been added. The latter addition was made ecause some fungi "produce diseases that mimic e clinical and pathological signs of tuberculosis such an extent that the mycoses must be con- dered in making a differential diagnosis."

The section on the tuberculin test has been nlarged to an entire chapter in recognition of its owing importance. Abstracts from this chapter llow:

> "There has been much discussion of the value of the berculin reaction as a case-finding tool. As a screen- g test it identifies on the one hand persons who do ot need further testing or examination for the presence tuberculosis, and on the other those who do need rther study. Its value as a screening test is generally w in population groups where tuberculous infection is widely disseminated that the majority of persons act, and correspondingly high in population groups here dissemination is restricted and few react to the st. The tuberculin test has special value when em- loyed periodically in groups with unusual exposure to e disease, such as nurses, doctors, and students in hospitals or other places where cases of tuberculosis may be concentrated."
>
> ". . . Of the tuberculin tests, the intracutaneous method is the most sensitive. It permits the administration of accurately graduated amounts, thus making it possible to detect cases with a low threshold of sensitivity to tuberculin. The general use of the Pirquet and the patch tests is not recommended since they are not as reliable as the Mantoux, particularly in adults."

Changes in the treatment of tuberculosis are reflected in the insertion of a chapter on bacteriology as it relates to chemotherapy in which special attention is paid to the principles involved in tests to determine the drug-susceptibility of tubercle bacilli. Several paragraphs are devoted also to a description of methods to be employed in order to study bacteria in lesions removed by surgery.

The chapter on screening classification for mass chest x-ray surveys deals with two kinds of mass surveys which have been "highly successful"—community-wide and special group surveys. Emphasis is placed on the importance of x-raying all hospital admissions and outpatients. "The effort to promote and maintain the hospital's interest in this program is well repaid," the book states," as experience indicates a three to four times greater incidence of tuberculosis than is found by chest roentgenologic surveys of the general population. Also, attention may be drawn to other pulmonary and cardiac abnormalities hitherto unrecognized."

Ever since 1917, when the first formal edition appeared, *Diagnostic Standards* has made possible a uniform interpretation of diagnostic findings in tuberculosis and served as a guide for terms used to designate the disease state. Today, *Diagnostic Standards* is known the world over. It is the standard reference book for medical students in this country and is widely quoted in medical literature in this country and abroad.

Editorials

John F. Briggs, M.
Arthur H. Wells, M.
Henry G. Moehring, M.

CHANGING CONCEPTS IN PSYCHOSOMATIC REACTIONS

The fact that psychophysiological mechanisms play a significant role in the development of disease is almost universally accepted by both medical scientists and clinicians. However, when it comes to formulating the nature and mechanics of the psychophysiological processes, there has been much less general agreement. The medical literature reflects definite changes in psychosomatic theory. Earlier studies associated typical overt personality descriptions with specific psychosomatic disorders as, for example, the driving, ambitious, successful person with peptic ulcer. Following this, there was an attempt to attribute the cause of a particular disorder to psychological factors which were both specific and symbolic. Peptic ulcer was said to result from a conflict between the wish to be cared for and a striving for independence. More recently, the trend has been to consider that many different psychological factors may produce a given disorder with the nature of the response depending upon constitutional factors and acquired vulnerability of the organ involved. Thus, peptic ulcer may be produced by conflict over dependency needs, conflict about expressing hostile or aggressive impulses, conflict regarding sexual (masculine-feminine) drives, or combinations of these conflicts within a given individual.

This concept of multicausality has become increasingly popular under the aegis of controlled laboratory and clinical research. One reads with increasing frequency statements to the effect that investigators are less impressed with differences in the personality structures of patients with different psychosomatic reactions than with the similarities. Whether continued research will support the multicausality concept of psychosomatic reactions remains for the future. What does seem important at this point is that the problem is continually being more objectively evaluated by research methods rather than by setting about to "prove" by *post facto* means a particular pet theory as had been done earlier.

Clarence J. Rowe, M.D.

AGAMMAGLOBULINEMIA

Agammaglobulinemia, a newly recognized m
abolic disorder of the reticulum mesenchyme, w
first described by Bruton in 1952. His initial o
servation of electrophoretically absent gamn
globulin in a pediatric patient suffering from r
peated bacterial infections sounded the keynote
this disease. Subsequently, as many more repor
began to appear in the literature and clinical e
periences accumulated, two distinct forms we
delineated, the congenital and the acquired typ
The congenital type occurs only in male childr
and is transmitted as a Mendelian sex-linked rece
sive trait. The acquired type is found in both ma
and female adults, with no particular selective d
ferentiation with regard to age, and a history
previous good health is usually obtained.

The concept of immunologic paralysis in th
disease became apparent quite early to students
this disorder, in that in either the congenital or tl
acquired type, recurrent bacterial infections appe
to be a common denominator. Other findin
common to both include absence of iso-hema
glutinins, failure of plasma cell formation, a
sence of antibodies from the blood and tissues, a
failure of immunologic response to antigenic sti
ulation. A classical demonstration of the abo
was the successful transplant of a homograft
an agammaglobulinemic patient by Good a
Varco.

An important relationship stressed by Good h
been the absence of gamma globulin and co
comitant failure of plasma cell production. T
would implicate the plasma cell as being respo
sible for the formation of antibody and proba
gamma globulin as well. In one of Good's patie
who had resection of a lobe for bronchiecta
microscopic sections failed to reveal the prese
of any plasma cells. Although, characteristica
this cell type is very commonly encountered
pathologists in chronically diseased tissues,
plasma cells were found on microscopic exami
tion in this patient. Further antigenic stimulati
of lymph nodes, which in the normal person r
ularly results in medullary plasma cytosis, fails

duce plasma cell formation in nodes of the ammaglobulinemic patient.

Hypogammaglobulinemia and agammaglobu- nemia may be encountered as either a manifesta- on of a physiologic phenomenon or the result of disease state apart from agammaglobulinemia. he former is encountered as a delayed assump- on of gamma globulin production on the part of e infant, during which time progressive decrease the serum level of the passively transferred aternal gamma globulin is occurring. During is time, susceptibility to bacterial infections may increased just as in congenital agammaglobu- nemia.

The occurrence of hypogammaglobulinemia ay be noted as part of the nephrotic syndrome in ildren. Here, however, hypo albuminemia dif- rentiates between the electrophoretic patterns in e two conditions.

Paradoxically, agammaglobulinemic patients em to handle most virus infections well. How- er, virus hepatitis resulting in liver destruction ad death has occurred in these patients.

Prophylactic treatment with gamma globulin as proved successful in children. Although there some question of its efficacy in adults, at present seems the treatment of choice for agammaglobu- nemia. The recommended dosage is 0.6 cc. of andard gamma globulin preparation per Kg body eight given at four-week intervals. It may be hat the prophylactic antibiotic treatment will of- er even better protection of adults with agamma- lobulinemia or that a combination of the two ap- roaches will be the most effective means of pre- enting disease in these patients.

William F. Mazzitello, M.D.
Robert A. Good, M.D.
University of Minnesota

STATE PLANNING FOR PHYSICIANS

It has been said that it is just as important for very doctor to have a well-conceived, current state plan for the benefit of his family as it is for very family to have the services of a doctor. This true. No course of treatment is possible if death liminates the opportunity to plan one's affairs.

In our work as executor of wills, as trustee of oth living trusts and trusts under wills, and as in- estment agent, we have seen the estate plans of any doctors, which have been prepared by their ttorneys. It has been our duty, acting either alone or in conjunction with a friend or a member of the family, to carry out the terms of the plan as expressed in the will or trust agreement. From this experience, we can make certain generalizations. Often the estate of the doctor consists of a fine home, a comparatively large life insurance program, securities, and the value of his practice. The latter may be a sole interest or a partnership interest. In rural areas, the doctor may have investments in farm lands.

The value of all of the above property is includable in the doctor's taxable estate. In most cases, this value exceeds $60,000, the amount of the federal estate tax exemption. Thus, the doctor needs the benefit of careful estate planning to make sure his estate qualifies for the "marital deduction." This is a provision which enables an estate owner to pass to his surviving spouse, either outright or in trust, one-half of his estate free of federal estate taxes. It is also very important that the "second set" of taxes be saved for the benefit of his children.

The doctor should be sure that the management of his assets will be in experienced and competent hands after his death to assure the security of his family and to relieve his wife of these unfamiliar burdens. If the doctor is relatively young, he should be concerned about not only the care and support of his wife in the event of his death, but also the education and maintenance of the children if both he and his wife die during the minority of the children.

If he is in a partnership, it is probably advisable that he have a partnership agreement, and in many cases a buy-and-sell arrangement with the other partner or partners, possibly funded by life insurance.

If the doctor is in a high income tax bracket and has any sizable amount of income-producing assets, he may find it advisable to create short-term trusts, the income from which, during the ten-year period, could be taxed either to the trustee or to his children.

The doctor may find it advisable to make gifts and use part or all of his gift tax exemptions, both state and federal. Such gifts would remove part of his estate from the top death tax brackets.

Since the doctor is a busy man engaged in the most rewarding of all professions, from the standpoint of service rendered to humanity, he very seldom can give adequate time to his own financial affairs. He should investigate the services offered in an investment management agency account, in which investment recommendations are made to him, his entire portfolio is constantly reviewed, and all detailed work is done for him.

Because estate planning is the best use and arrangement of a person's property to carry out his objectives, every doctor needs estate planning to a greater or lesser degree as every layman may need medical assistance in varying degrees. Where does the doctor get his estate planning help? The key man is the attorney. All legal instruments, such as a will or a trust agreement, and the solution of all legal questions are matters for the doctor's own attorney.

Any trust company will be happy to share with the doctor the experience it has gained in the practical administration of many estates and trusts.

Harry L. Holtz
First Trust Company of Saint Paul

PAINT—ITS USE AND VALUE

Although paint and protective coatings have many uses and affect many phases of everyone's life, we might consider in a very limited manner its value as protection of property—home, building and the like—and— its value as beauty and decoration.

As a protective coating, paint is used to guard and protect property against the weather and ravages of rust and rot. Of course, thinking of exterior painting, the value of the home is also enhanced by beautifying its appearance. Exterior paint makes houses more pleasing to live in and gives people pride in their homes and neighborhood.

In studying the painting of the exterior and interior of a home, we run into the same problems that affect every type of structure, be it a store building, office, school, or institution. The exterior of a house may be constructed of a combination of materials such as wood, concrete, stone, brick, shingles (wood, asphalt, cement-asbestos), sash and doors of wood, aluminum and steel, all of which require different paint materials for the different assignments for protective coating and color. Whether you do the painting yourself as a hobby or out of necessity, or hire someone to do it for you, you should seek the advice and information regarding preparation, types of materials and methods of application from some reliable paint salesman or paint store or the services of a reputable painting contractor adequately covered with insurance. Too often paint failures result fro improper preparation, application and materi that cause no end of trouble and expense lat on. The very best paints placed in the hands unskilled or careless individuals will usually applied improperly and result in unsatisfacto service and appearance. A few basic principles remember when painting are: (1) be sure t surface you are painting is dry, (2) that moistu is not trapped behind the paint, (3) that paint not applied in too heavy a coat and the old co ings that are too thick, scaling and cracking ha been removed before applying another coat, (that each coat of paint is thoroughly dry befo another is applied, (5) and, last but not least, th the proper type of material for the surface to painted is selected and that quality material used.

The interior of a home or building, of cour is not painted with any thought of protecti against weather damage but as protection agai the hard knocks given by human beings as w as for beauty, cleanliness, light reflection and t like. Floors, more than any other surface, rea need protection against the hammering of hee unless they are completely carpeted. If the flo is of new wood it should be machine sanded fir followed with at least two applications of flo sealer and waxed; or, varnished two or thr coats. The only maintenance necessary from t point on would be washing and, on occasio rewaxing. Floors with a satin or dull finish ha more beauty than with a glossy finish. Ceilin and walls, whether plaster or drywall constructi (sheetrock), should be painted or papered with thought of applying a lovely color that wou give a smooth and eye-pleasing quality. If pai ed, a flat paint of the "alkyd" type should used with careful consideration in choosing col that will give pleasing, inviting and harmonio surroundings. Should you wish to paper wa that have been previously painted, all that necessary is to wash and prepare them first befo papering. However, if the walls are paper and you should wish to paint them, it is a go practice to remove the paper first, then wash th oughly and prepare before painting. In painti woodwork that has been previously painted, is always good practice to wash thoroughly fir prepare (sandpapering, puttying up holes a cracks and touching up bare and worn spots then apply an enamel as a last coat (gloss, sen oss, eggshell, satin or dull finish). In most cases, finish such as a low semi-gloss or eggshell gives e most pleasing finish. For many years now, has been a desire of people to paint the woodork the same color as the walls or to match e background of the wallpaper. In areas such kitchens and bathrooms that are to have the ilings and walls painted, it is best to use the ne type of material (enamel) that has been ntioned above for woodwork.

In closing, it may be said that a painted surface ceiling, wall or woodwork—may last a long ne if properly cared for and washed properly. important step in washing is not to use the ap solution too strong and to rinse after washg with a soap solution. To repeat, paint is of emendous value from the standpoint of protecon, beauty, cleanliness, light reflection, safety d health.

M. Walter Sime

HE HISTORY OF GLASS CONTAINERS

Glass, like sunshine, is such a basic part of eryday life that we never give it a thought. But ithout glass—as without sunshine—it would be dark and barren world. There would be no indow panes or electric light bulbs, no microopes or thermometers, no mirrors or eyeglasses. cameras, television or hundreds of other things hich contribute either to the preservation or enyment of life.

And without glass, there would, of course, be no ass jars or bottles. Made by the billion in merica today, glass containers bring us an almost dless list of foods, beverages, medicines, toiletries d household products, which we could not do ithout. Produced in every shape and color, and nging in size from the tiniest medicine bottle to ant demijohns holding many gallons, these durle, transparent and attractive bottles and jars ave a rich and romantic history stretching back r thousands of years.

Just when and where the first "man-made" glass as produced has never been determined. One ncient legend credits a group of Phoenician ilors with making the world's first glass. The ory goes that the Phoenicians beached their boat n the sandy shores of a tidal river. Finding no cks on which to rest their cooking pots, they used lumps of natron—a crude soda ash cleansing agent—from the ship's cargo. Fanned by sea breezes, their camp fire blazed hot. When it died the sailors found in the ashes a shiny substance which became hard when it cooled. Since two of the basic ingredients of glass are sand and soda ash, this may have been how one of man's greatest gifts—glass—was accidentally discovered. Actually, nobody knows.

It is known, however, that many thousand years before the birth of Christ, Egyptians, and possibly some of their neighbors, were producing glass which they used to glaze or coat small stones to make beads. The world's first glass containers were made in Egypt some four thousand years ago by an extremely slow and laborious process. Using metal rods, Egyptian glassmakers pulled glass threads from a cauldron of molten glass and painstakingly wound the strands around a mold formed of sand. After the glass had hardened, the sand was scraped away to leave a hollow container.

Ancient craftsmen continued to make glass jars and bottles in this slow and tedious way for hundreds of years. Finally, however, the blowpipe—a long hollow metal tube with a bell-shaped end, was invented about 300 B.C. Blowers dipped the end of the blowpipe into a molten batch, gathered up a small gob of glowing glass, and formed it into rough shape on a marble slab. Then, blowpipe to lips, the glassmaker raised the pipe about his head, twirling the glass through the air in circles to create the shape he had in mind by centrifugal force. This free-blown method obviously required great skill—as well as time and lung power! Molds were the next milestone in the long and slow evolution of glass containers. This combination of blowpipe and mold made it possible to produce more uniform and more decorative bottles, jars, flasks and other hollow ware in a fraction of the former time.

John M. Foster, *President,*
Foster-Forbes Glass Company

ALCOHOL AND DRIVING

There are more than sixty pathological conditions which have some or all the symptoms of intoxication. Some time ago a police officer reported that he had followed a car for several blocks because the car was weaving. He found that the driver's speech was incoherent, and that he stag-

---

First in a series of editorials on the subject of glass nd glass containers.

Third in a series of editorials on alcoholism.

gered. The driver insisted that he had *not* been drinking, and that if he could have a candy bar, he would be all right. He was given candy and within a few minutes he was perfectly normal. Here was a diabetic person who had had an overdose of insulin. Thus it is possible that an innocent person may be accused.

To provide definite evidence, chemical tests should be given.

The standards for indicating degrees of intoxication are usually expressed in terms of percentage of alcohol in the blood.

When alcohol is taken, it passes unchanged into the blood stream which carries it to all parts of the body in direct proportion to the water content of the tissue or organ. It is the effect upon the brain that produces the symptoms of intoxication.

Blood alcohol level:

.02%-.20%	Stage of euphoria.
.12%-.28%	Stage of incoordination. There is no doubt that above .15% the person is under the influence of an intoxicant.
.24%-.40%	Stage of confusion. The man is drunk.
.32%-.50%	Stage of complete anesthesia. Sometimes the individual will "pass out."
.50% or over	Stage of grave danger. The individual is in danger of death.

The American Medical Association has agreed upon standard figures as a guide to legal procedure. In some places these have been written into law. If a person has .15 per cent or more alcohol in the blood, he is unquestionably under the influence of liquor.

PAUL S. RAHNEFF
Citizens Commission on
Alcoholism, Inc. of Minnesota.

THE TREATMENT OF TUBERCULOSIS TODAY

Popular belief to the contrary, tuberculosis is not yet headed for extinction. In fact, after years of watching the steady decline in deaths from this cause, we now reach the paradoxical position of treating about the same number of patients that we were treating several decades ago. The discrepancy is more apparent than real, of course, the high prevailing incidence merely reflecting the survival nowadays of chronic cases whose disease would have proved fatal in the pre-streptomycin era. Then, too, there is the added factor of vastly improved case finding. The important thing is that tuberculosis still constitutes a problem of n small magnitude.

Even so, there can be no questioning the clai that there has occurred more progress in the trea ment of tuberculosis since 1947, the year th streptomycin became generally available, than i all previous years put together. There remai many unsolved problems, it is true, but much the early controversy about chemotherapy has bee resolved and there now exists some unanimity opinion as to how the average fresh case of tube culosis should be managed.

In the initial studies of streptomycin, it soo became apparent that the tubercle bacillus rath promptly grew resistant to streptomycin giv alone. Quite opportunely, it was discovered th the combination of streptomycin and par aminosalicylic acid (PAS) significantly delayed t development of bacterial resistance. Still later, was found that twice weekly streptomycin a ministration was no less effective than a dai schedule, with the added advantage of furth prolonging bacterial sensitivity to streptomyci though lessening the hazard of cumulative toxicit

Isoniazid, since its availability in 1952, h earned a place alongside streptomycin and PA As with streptomycin, bacterial resistance i variably attends the administration of isoniazi alone, but is considerably delayed by giving stre tomycin or PAS concomitantly. Current belief that all three possible combinations of drug namely, streptomycin and PAS, isoniazid and PA and streptomycin and isoniazid are equally effe tive. The use of all three drugs at once seems t provide no additional benefit and is best avoide Because of the possibility that isoniazid-pyrazin mide combination may prove to be equally if n more effective, it might be wise in the averag virgin case to defer the use of isoniazid, in th event a second course of therapy should ever necessary. This would not apply in cases miliary or meningeal tuberculosis, where isoniazi is particularly efficacious.

The accepted dosages are: streptomycin, gram intramuscularly twice weekly; PAS, 12 gra orally daily in three divided doses; isoniazid, 3 mg. orally daily in three divided doses. As y neither pyrazinamide nor cycloserine can be a vocated because of the unresolved question toxicity.

Ideally, treatment should be instituted early, few weeks sometimes making a big difference b

use of the necrotizing nature of the infection.
eatment should be continuous, for interrupted
erapy tends to increase bacterial resistance.
eatment must be prolonged or reactivation may
sue. For practical purposes, it can be said that
emotherapy should be continued for at least six
nths after all lesions can be classed inactive,
at is, six months after serial x-rays indicate
bility, planigrams show closure of all cavities
d the sputum is consistently negative for
bercle bacilli.

Other measures deserve comment. Bed rest,
ce the keystone of antituberculous therapy,
ould be used with prudence. Certainly, in the
ute phase of the disease complete rest is in-
spensable, leading to a reduction in fever, cough
d expectoration. Conversely, once symptoms
bside, an overly rigid attitude toward bed rest
ay promote discontent without contributing sig-
ficantly to treatment. At the opposite extreme,
e so-called ambulatory treatment of the tuber-
lous patient, while reducing the disability period
d hospital expense, may also reduce the chance
r cure.

Collapse measures, such as pneumothorax, pneu-
operitoneum and phrenic nerve crush, seem to
ve a steadily diminishing value, being at this
ne of more historical than practical importance.
oracoplasty is still a good operation with a high
te of cavity closure in selected cases. In gen-
al, however, outside of chemotherapy excisional
rgery stands out as perhaps the most important
cillary measure in the treatment of the disease.
resecting diseased tissue, especially cavitary dis-
se, permanent arrest of the infection may be as-
red. In essence, surgery is utilized for any
ngerous residua of chemotherapy.

As emphasized elsewhere, "the secret to the suc-
ssful management of the patient with pulmonary
berculosis lies not in any one drug, nor in any
e surgical feat, nor in any one therapeutic
ctum, but in the carefully planned and integrat-
use of all these many measures under the joint
pervision of the internist, bacteriologist and sur-
on working with the closest possible co-ordina-
on."†

J. Winthrop Peabody, Sr., M.D.

READER INTEREST POLL

At this year's Minnesota State Medical Association's meeting in Rochester, Minnesota Medicine will have a booth devoted to a *Reader Interest Poll.* The purpose of the poll is to learn how this journal can improve its service to its readers. Minnesota Medicine is your journal, so you have a strong motive to seek out this booth and let us have five minutes of your time to record your opinions about the journal.

The poll will be conducted by professional pollsters from the Department of Journalism of the University of Minnesota and will cost you money . . . even if indirectly. That gives you an additional motive to visit the polling booth; i.e., to make sure that you are getting your money's worth.

Give us the benefit of your opinions at the Rochester meeting.

ELECTROLYTE DISTURBANCES IN DEHYDRATION

(Continued from Page 293)

2. Verney, E. B.: Antidiuretic hormone and the factors which determine its release. Proc. Roy. Soc. London, B135:25, 1947.
3. Gamble, J. L.: Chemical Anatomy, Physiology and Pathology of Extracellular Fluid. Cambridge: Harvard University Press, 1951.
4. Wallace, W. M., and Moll, F. C.: Balance and electrocardiographic studies in a child with potassium deficiency. Pediatrics, 4:287, 1949.
5. Eliel, L.; Pearson, O. H., and Powson, R. W.: Postoperative potassium deficit and metabolic alkalosis. New England J. Med., 243:471, 1950.
6. Welt, L. G.; Seldin, D. W.; Nelson, W. P.; German, W. J., and Peters, J. P.: Role of the central nervous system in the metabolism of electrolytes and water. Arch. Int. Med., 90:355, 1952.
7. Rapoport, S.: Hyperosmolarity and hyperelectrolytemia in pathologic conditions of childhood. Am. J. Dis. Child., 74:682, 1947.
8. Finberg, L., and Harrison, H. E.: Hypernatremia in infants. Pediatrics, 16:1, 1955.
9. Weil, W. B., and Wallace, W. M.: Hypertonic dehydration in infancy. Pediatrics, 17:171, 1956.

The importance of environmental factors upon morbidity and mortality of tuberculosis has long been recognized. In a disease where the invasive powers of the agent are in such delicate balance with resistance of the host, factors which substantially augment the virulence of the causative organisms or depress the resistance of the host logically will determine the trends of the disease.—Alton S. Pope, M.D., and John E. Gordon, M.D., *American Journal of Medical Sciences,* September, 1955.

---

†Peabody, J. W., Sr., Katz, S., Davis, E. W., and
abody, J. W., Jr.: Current concepts in the manage-
ent of pulmonary tuberculosis. J. Am. Ger. Soc.,
566 (Aug.) 1955.

President's Letter

A TRIBUTE TO ORGANIZED MEDICINE

A few days hence we shall be gathering at Rochester for the 103rd Annual Meeting of the Minnesota State Medical Association.

To most of us this is primarily a scientific meeting, providing an opportunity to bring ourselves up to date on medical knowledge and equipment, but the meeting also provides some 100 commercial exhibits where you can see and study the latest in equipment, drugs and techniques. For your relaxation, there are special society luncheons and dinners and the usual assortment of sports events on the Sunday preceding the meeting.

This is what the annual meeting means to most of us. We have splendid meetings, and Minnesota can justly be proud of their caliber. But I wonder whether we ever give much thought to another side of our annual meeting.

Have we ever realized and appreciated the months of organization and preparation that the committee on local arrangements of the host city must engage in so that everything runs smoothly? Do we ever think of the effort put forth by Executive Secretary Rosell and his staff in providing the exhibits which are so vital to the financial success or failure of such a meeting?

Do we realize how much easier it makes the job of selling exhibition space if we stop to register with the exhibitors?

Do you realize that the Council and officers of the Association arrive on the scene the Saturday preceding the meeting; that from then until the close of the session they are in almost continuous session, usually starting with a 7 a.m. breakfast?

Do you appreciate the fact that the reference committees meet at 10 a.m. on the Sunday preceding the meeting?

To the House of Delegates, the annual meeting means two long sessions on Sunday preceding the meeting and another one on Monday, and, believe me, those chairs get harder and harder!

Do you set aside time at your succeeding component society meeting for your delegate to make a report so that you may be kept informed on current problems, or do you make him fight for a few minutes' time? I was a delegate for fifteen years from my component society and I am embarrassed to state how few times I was asked or given the opportunity to make a report.

So much for the annual meeting. There is much more to organized medicine in Minnesota and every other state. Do you know that there are twenty-three state scientific committees with a total of 239 devoted men serving on them, giving freely of their time and knowledge that the people of Minnesota might have better health?

In addition, there are approximately twenty-five non-scientific committees with a total of 190 members. These committees are concerned with editing and publishing our journal, with medical economics, medical relations, malpractice insurance, physicians' assistance, and numerous other phases of organized medicine. Mention must also be made of the fine group of men who over the years have given so generously of their time and talents in representing us as delegates to the two annual meetings of the American Medical Association and meetings of national committees on which they serve.

This letter is not meant to be critical, but rather as a tribute and expression of appreciation of the time and talents all of these members have so graciously and devotedly given to the cause of organized medicine. Their only reward is the satisfaction of a most worthy job well done.

R. H. Wilson

President, Minnesota State Medical Association

Medical Economics

Edited by the
Committee on Medical Economics,
Minnesota State Medical Association
George Earl, M.D., Chairman

DMINISTRATION OPPOSES DISABILITY AYMENTS UNDER SOCIAL SECURITY

The Eisenhower administration is firmly op- sed to two major provisions of the House-ap- oved social security amendments (H. R. 7225, mmarized in the January, 1956, section on ledical Economics"). These provisions are the vering of the retirement age for women, from ty-five to sixty-two and cash payments to dis- led workers at age fifty. The position was set rth March 22 by HEW Secretary Folsom, the 1st and final witness to appear before the Senate nance Committee since last January.

Folsom said that the medical testimony pre- nted on the difficult problem of determining gibility for disability payments, in his judgment, s very convincing.

He also stated:

> "The nation has already made significant progress in cent years in helping the disabled. About 244,000 edy disabled persons are now receiving payments of 65 million annually. Under the present system, cash yments are made only upon death or retirement. These nditions are easy to determine.
>
> "Under the disability proposal, however, the primary ndition for payment would be 'inability to engage in y substantial gainful activity, or mental impairment ich can be expected to result in death or to be of ng continued and indefinite duration.' These condi- ns are much more difficult to determine.
>
> ". . . Numerous medical witnesses have testified to is committee as to the great problems which they fore- e in evaluating physical and mental conditions for rposes of disability determinations. I believe the stimony of so many medical experts as to the problems volved in determining disability must be given con- lerable weight."

ifficulties in Controlling Cost

Folsom went on to discuss the uncertainties of e cost of such a program. He pointed out that e "cost estimates for disability are subject to a r wider range of variation than for other types benefits."

"It would also be possible," he added, "that e age limit of 50 could be lowered and that sh disability benefits at any age would cost so- al security taxpayers almost $1½ billion a year 1980."

Relationship to Vocational Rehabilitation

In discussing the relationship of cash disability benefits to vocational rehabilitation, Folsom said he believed that the latter was the most constructive approach to disability. He added:

> "Witnesses have testified that cash benefits may reduce the incentive of some disabled persons toward rehabilitation—particularly if the benefits, when combined with other resources, adequately meet essential needs.
>
> "Our own experience with the rehabilitation process," he said, "indicates that the drive and willpower of the individual is the most important single factor in determining his chances of successful rehabilitation. The committee is faced with a proposal for legislation in a delicate area of human motivation. It is impossible to proceed with the same degree of assurance that has accompanied other steps in the expansion of the social security system."

Summarizing his objections Folsom said:

> "There is a great divergence of opinion on the difficulties of administering a cash disability program, our ability to control the costs and the effects on vocational rehabilitation. On the other hand, we are making significant progress in helping disabled people—through assistance payments to the needy, the rehabilitation program and the disability freeze. We need more time to develop these programs fully and to evaluate their results."

Opposition to Lowering Retirement Age for Women

Referring to the section in the bill lowering the retirement age for women, Mr. Folsom noted that this would cost about $400 million the first full year and more than $1 billion annually by 1970. The proposal has been considered carefully several times in the past twenty years, but "Congress has always concluded that any overall values of a lower retirement age were outweighed by the heavy cost. And there has been a serious question as to the logic of a discrimination in retirement age between women and men."

Writing Your Congressman

Physicians are urged to continue writing thoughtful letters to their congressmen on their objections to H.R. 7225, although it is believed the Senate Finance Committee will go slow on Social Security revisions and that floor action will not come until midsummer.

On this and other issues, doctors have had a number of reasons in recent years to take special interest in their congressmen. The health question has certainly made taxes and defense, for example, items of conversation, and congressional study of almost secondary political importance. Physicians throughout the nation should express themselves from time to time on matters that concern them and their patients. As a practitioner, he has a right, too, to demand things that best enable him to practice the type of medicine for which he has trained and devoted himself.

The Hoover Report Division of the Taxpayers' Federation of Illinois has issued a small pamphlet in which are suggested certain rules for writing your congressman if the letters are to have the most effect:

1. Write on a specific issue or principle, and do not try to cover more than one in a letter.
2. Be brief. Tell your point of view and your reasons.
3. Do not follow a form letter. Give your own ideas in your own way. It is the straightforward, sincere letter that commands attention.
4. Be friendly and courteous. Do not be abusive.
5. Do not use carbon copies. Write to each one individually.
6. Write a "thank you" note when one of these men does something you like. They are often criticized, seldom praised.
7. Be sure to sign your letter legibly and give your address.

ARE DOCTORS GOOD BUSINESSMEN?

The 1955 study on "What Americans Think of the Medical Profession" reveals that over 50 per cent of the general physicians polled believe that they themselves are not good businessmen. Fifty-two per cent of the internal medical specialists, 54 per cent of the surgeons and 58 per cent of other specialists agreed.

On the other hand, only 10 per cent of the men in the lay group surveyed said they believe it was "true" that doctors were poor businessmen. Eight per cent said it was "possibly true"; 38 per cent said "false," and 10 per cent said it was "probably false."

A total of 81 per cent of physicians believe they are poor businessmen; 13 per cent disagreed, and 6 per cent had no opinion.

Of the general public questioned, a total of 17 per cent believed doctors are not good bus nessmen; 48 per cent disagreed. The remainir had no opinion.

Reasons the overwhelming majority of phys cians gave for believing they are not good bus nessmen were listed in this order: "They are to busy; they stay out of business because they b come 'easy marks'; they are not trained in bus ness; too many collections, poor records and po management; they are interested only in mec cine; it takes too much experience and obser tion; they don't think about money; they're to softhearted and don't always charge; most of the are not wealthy; they leave small estates and mar debts; they let others handle their business; th are not business-like with patients."

The doctors who believed they *are* good bu nessmen gave these reasons for their opinion "they have investments; they live well and are su cessful; the manner in which most keep colle tions and records is good; they are intelligent ar educated; they make money and generally ha good incomes; they have good personal know edge."

Those laymen who believe doctors are po businessmen gave these reasons for their answer "doctors are too busy, too interested in medici only; they are weak managers and have po records; they are not trained in business; they others handle their business; they are not busine like with patients; they are soft-hearted and doı charge; they don't think much about money."

The 48 per cent of the general public w believe physicians *are* good businessmen say th have this idea because "doctors live well and a successful; they are intelligent, capable and ed cated; they make money and have big incom they are businesslike in their billing and collectir they have investments and many material poss sions; they are busy and have many patients a they charge high fees."

WHAT DO DOCTORS THINK OF SOCIAL SECURITY?

In state surveys made in various parts of t country, the number of doctors who believe i compulsory social security for the profession s less than 10 per cent.

The largest poll tabulated up to February w that taken by the Ohio State Medical Associati. Ballots were sent to 8,360 members. The m question was: "Do you favor extension of O ge and Survivors' Benefits coverage of the Fedal Social Security Program to Physicians?" The llot was accompanied by material prepared by e affirmative and negative sides. There were 912 ballots returned (about 60 per cent). Of ese, twelve could not be tabulated because of egularity of answers. Of the remaining 4,900, arly one-half, 2,441, voted "no," indicating that ey did not want social security under any cirmstance.

Of the 2,459 favoring some form of coverage, 070 said they wanted it on a voluntary basis. nly 370 were in favor of compulsory coverage.

In Indiana, on the basis of 2,333 replies to 513 questionnaires sent out by the Indiana State edical Association, there were 703 doctors who re for some form of social security. Of these, 9 gave their assent to such coverage, provided was voluntary. Only ninety-one wanted a mpulsory program.

The Rhode Island Medical Society and Province Medical Association polled 800 members. sable returns were received from 450. Opposin to any form of social security totaled 152. hose favoring a voluntary system numbered 264. nly thirty-four voted for a compulsory program.

The Arkansas Medical Society sent out about 200 questionnaires and to the end of January ad 836 usable replies. There were 785 votes gainst a compulsory program. Of these, 411 docrs were agreeable to a voluntary coverage, but 74 wanted no part of social security. The proonents of a compulsory plan numbered fifty-one.

The AMA has consistently opposed the inclusn of physicians in any social security program n a compulsory basis. It has stated that it will ot oppose an amendment permitting voluntary articipation.

A poll of Minnesota physicians is now being conucted on the same subject. It is believed that e survey will probably confirm the findings in ther states.

ATASTROPHIC HEALTH INSURANCE OR FEDERAL EMPLOYES

The administration is about ready to present Congress its program for major medical cost surance for the 2,000,000 U. S. civilian emloyes and their 2,500,000 dependents. All U. S. nployes and dependents who are participating the two-year-old federal group life insurance rogram would receive this catastrophic health insurance protection at no cost to themselves. The entire cost—about $32½ million annually—would be paid by the United States.

To varying degrees, hospital, surgical and medical care costs would be covered. The major medical care benefits, however, would not apply until $500 of hospital costs were paid annually by the employe. After that the United States policy would meet 75 per cent of the cost. The employe would be reimbursed for 75 per cent of all surgical costs after he had paid the first $250. He would be expected annually to stand the first $100 and would be reimbursed for 75 per cent of the remainder. The assumption is that in most cases the employe would protect himself against these initial payments by purchase of basic health insurance.

MEDICAL LIBRARY BILL

Senator Hill, (D., Ala), with Senator Kennedy, (D., Mass.), as co-sponsor, has introduced a bill taking the Armed Forces Medical Library from under the Defense Department and setting it up as a separate entity with the name of "National Library of Medicine." They left open the question of whether to place it under the Smithsonian Institution as recommended by the Hoover Commission or under some other agency such as the Department of HEW. One of the points cited by Senator Hill for the bill is that the present library, with its wealth of material, provides considerable information for civilian medical science. Senator Kennedy stressed that the library cannot compete for funds in the Defense Department against the needs and demands of national defense. The bill has been referred to the Senate Labor and Public Welfare Committee, which has no immediate plans for hearings.

The AMA's House of Delegates in June, 1954, urged a new building for the present library and called on the government to give it "immediate priority."

SOME DOCTORS MISS THIS TREAT

The 75 per cent of doctors in general practice who disagreed with the statement, "Compared with their patients, most doctors make too much money" in the poll, "What Americans Think of the Medical Profession," last year apparently agree with the statement that "wealthy doctors, like all wealthy people, miss one of the greatest thrills in life—paying off that last installment!"

The Dean's Page

LEADERSHIP IN MEDICINE

A recent issue of the new *University of Minnesota Medical Bulletin* points out some interesting information concerning alumni of our Medical School. From time to time, the *Bulletin* carries news items concerning our alumni. It has been apparent from these news items that a good many of our alumni occupy positions of importance medically in many parts of this country. It has been particularly impressive, however, to note the manner in which our graduates have become active leaders of medicine in Minnesota.

At the present time, the President, the immediate Past President, both Vice Presidents, the Secretary, the Treasurer, the Speaker of the House of Delegates, and the Chairman of the Council of the Minnesota State Medical Association are alumni of our Medical School. All of the newly installed officers, as well as the out-going president, and the new directors of the Minnesota Academy of General Practice also graduated from Minnesota, as did the new officers of the Southern Minnesota Medical Association and the incoming and retiring presidents of the Northern Minnesota Medical Association. Our alumni have been instrumental in the development and activities of a number of other important medical organizations in this state.

Our entire faculty takes justifiable pride in this record. We believe that it shows that our alumni have not only practiced an excellent brand of medicine but that, in addition, they have assumed their share or more of leadership in the medical community.

HAROLD S. DIEHL, *Dean*
University of Minnesota Medical School

In Memoriam

USTAF A. HEDBERG

Dr. Gustaf A. Hedberg, medical director of Nopeming natorium, Nopeming, Minnesota, died March 27, 1956, Tallahassee, Florida. He was forty-nine years old.

An authority on tuberculosis treatment and control, was awarded the 1955 Dearholt medal for outstand- service in tuberculosis control at the Mississippi lley Conference on tuberculosis last October.

He is credited with originating the first mobile x-ray t for tuberculosis survey in 1943. He is also credited h using new drugs to shorten tuberculosis treatment.

Dr. Hedberg joined the Nopeming staff shortly after received his medical degree from the University of nnesota in 1930.

He was a member of the St. Louis County Medical iety, the Minnesota State Medical Association, the nerican Medical Association, the National Tuberculosis sociation, the American Sanatorium Association, the nnesota Trudeau Society and the Duluth Society of ernal Medicine.

Survivors include his wife, Iris; two daughters, Susan d Karen, both of Nopeming; two sisters, Mrs. Carl ad, Saint Paul Park, and Mrs. John E. Ross, Minne- olis, and a brother, Robert, El Sobrante, California.

ENRY N. KLEIN

Dr. Henry N. Klein, former chief of staff of Saint seph's Hospital, Saint Paul, died April 16, 1956, after long illness.

Dr. Klein practiced medicine for fifty years and served the staffs of Saint John's, Ancker, Miller and Saint ke's Hospitals and the Wilder Dispensary.

He was graduated from the University of Minnesota edical School and held membership in the Ramsey ounty Medical Society, the Minnesota State Medical sociation and the American Medical Association.

A member of the University Club and a veteran of th the Spanish-American War and World War I, . Klein also served as head of the dermatology de- rtment at the Wilder Dispensary.

Survivors include his wife, Josephine E.; a son, Rich- d E., and three grandchildren, all of Saint Paul.

COTT G. LARRABEE

Dr. Scott G. Larrabee, a Saint Paul eye, ear, nose and roat specialist for thirty-three years, died April 2, 1956. was seventy-one years old.

Born in Scarboro, Maine, he was a graduate of Bow- in University in his home state. Dr. Larrabee lived at 80 Iglehart Avenue, Saint Paul.

Survivors include his wife, Nellie; a daughter, Mrs. orge T. Hammond, and three grandchildren, all of int Paul, and two brothers, Alvin, Detroit, Michigan, d Ralph, who still lives in Maine.

HENRY H. LEAVITT

Dr. Henry H. Leavitt, a Minneapolis physician fifty-eight years, died March 18, 1956. He was ninety-four years old.

A native of Waterloo, Iowa, he was the oldest living graduate of Beloit College, Beloit, Wisconsin. He also graduated from Chicago Homeopathic Medical College, came to Minneapolis in 1890 and taught medicine at the University of Minnesota before entering private practice. He retired in 1948. During his retirement, he lived in Phoenix, Arizona, until 1954.

Dr. Leavitt was a general practitioner for many years before specializing in eye, ear, nose and throat medicine.

He was a member of the Hennepin County Medical Society, the Minnesota State Medical Association and the American Medical Association.

Survivors include three daughters: Mrs. R. M. Bell and Mrs. N. S. Mitchell, Minneapolis, and Mrs. M. N. Clark, Oakland, California. Mrs. Leavitt died in 1954.

JOSEPH A. LEBROWSKE

Dr. Joseph A. Lebrowske, pioneer Minneapolis physician, died April 1, 1956. He was seventy-five years old.

Born in Russia, Dr. Lebrowske received his early education in Minneapolis and graduated from the Minneapolis College of Physicians and Surgeons, formerly affiliated with Hamline University.

The Hennepin County Medical Society, of which Dr. Lebrowske was a member, recently honored him for fifty years of service. He was also a member of the Minnesota State Medical Association, the American Medical Association, the Kenesseth Israel Synagogue and the Woodmen of the World.

Survivors include his wife, Florence; two sons, Bernard, Westport, Connecticut, and Harold, Saint Paul; four daughters, Mrs. David Smith, Los Angeles, California, and Mrs. Martin Yavitz, Mrs. Samuel Held and Mrs. Wilbur Jansen, Minneapolis; and two sisters, Mrs. Ida Hoffman, Minneapolis, and Mrs. Israel Lazarus, Milwaukee, Wisconsin.

FLETCHER W. PENHALL

Dr. Fletcher W. Penhall, a pioneer physician in Morton, Minnesota, died April 2, 1956, at Redwood Falls. He was ninety-three years old.

One of Minnesota's oldest practicing physicians, he retired a year ago after serving the people of Morton for fifty-three years.

Dr. Penhall set up practice in Morton in 1891 after graduating from Bellevue Medical Center in New York. He was born in Brooklin, Ontario, Canada, and took his first medical training at Trinity Medical College, Toronto.

A member of the staff at Willmar State Hospital, Dr. Penhall also served on the Morton Village Council for three years and on the Board of Education for fifteen years. He was a former president of the Camp Release Medical Society, a member of the Renville-Redwood County Medical Society, the Minnesota State Medical Association and the American Medical Association.

Survivors include four daughters: Mrs. John Allen, Mrs. Glenden Judd and Lillith Penhall, Minneapolis, and Mrs. Irving Eustis, Florida. Two other daughters preceded him in death. Lillian, died in 1899, and Jessie, in 1952. Mrs. Penhall died in 1942.

IVAR SIVERTSEN

Dr. Ivar Sivertsen, a Minneapolis physician and surgeon for fifty-one years, died March 17, 1956. He was seventy-nine years old.

Born in Christiansund, Norway, Dr. Sivertsen graduated from Hamline University medical school in 1904. After internship in St. Joseph's Hospital, Saint Paul, he continued his medical studies in Vienna, Austria.

He later taught obstetrics and gynecology at the University of Minnesota.

Dr. Sivertsen retired from medical practice last July. He was one of the original staff members of Fairview Hospital. Earlier this year, he retired from the State Board of Medical Examiners, to which he had been appointed in 1931.

He was also a founder of Central Lutheran church, a charter member of the Minneapolis Club and a Shriner. He served as an army captain during World War I.

A member of the founders' group of the American Board of Surgery, Dr. Sivertsen was also a fellow of the American College of Surgeons, a member of the Hennepin County Medical Society, the Minnesota State Medical Association and the American Medical Association.

Survivors include his wife, Maybelle; two sons, Ivar, Jr., San Jose, California., and John W., Akron, Ohio; three daughters, Wilma Clare, New York, and Anne and Mrs. Margaret Larson, both of Minneapolis, and two brothers, Dr. Andrew and John A., both of Minneapolis.

JOHN E. SOPER

Dr. John E. Soper, Minneapolis, died March 24, 1956. He was eighty-nine years old.

Dr. Soper, a University of Minnesota graduate, was captain of the 151st Field Artillery medical corps in World War I. He was chairman of the National Cemetery Association; chairman of Soldiers Home Committee; national vice president of Rainbow Division Association; Spanish War Veterans, and Sons of Union Veterans. He was also active in American Legion, DAV and VFW activities and was a past exalted ruler of Elk Lodge 44 and a member of Lynnhurst Masonic Lodge.

He practiced medicine in Norwood and Delano, Minnesota, for twenty-one years and served as mayor of Norwood and as Carver County coroner.

Surviving is his wife, Mildred E. Soper.

GREGORY VAN BEECK

Dr. Gregory Van Beeck, a native of Hastings, M. nesota, died March 13, 1956, in Big Springs, Texas. e was sixty-five years old.

Dr. Van Beeck graduated from the University of M. nesota medical school and practiced for two year t Mazeppa, Minnesota. He later entered the United St s Public Health Service and was assigned to posts all the United States, Europe and Central America.

Eight months ago, he resigned his position as mec l director of the Public Health Service.

Funeral services were held in Hastings, March 19

Survivors include his wife, Margaret; a brother, C ens, and a cousin, Mrs. Nick Conzemius, both of H ings.

HENRY JOURNEAY WELLES

Dr. H. Journeay Welles, former deputy corone of Hennepin County, died February 26, 1956, in Mi apolis. He was eighty years old.

Dr. Welles was deputy coroner from 1943 to 195

A 1901 graduate of the University of Minn a medical school, he practiced medicine in Minnea is fifty-five years. He was a member of the Henn n County Medical Society and the Minnesota State M i-cal Association.

Dr. Welles was a past president of Zuhrah Sh e patrol and a member of Alpha Delta Phi and Phi a Pi fraternities.

Survivors include his wife, Bess, and a daughter, B y

WILLIAM E. WRAY

Dr. William E. Wray, physician at Campbell, Mi e-sota, for forty-four years, died February 26, 1956 in Breckenridge. He was seventy-seven years old.

He was a graduate of the University of Illinois me al school, class of 1897. After graduation, Dr. Wray se d one year in the medical corps of the U. S. Army du g the Spanish-American War. During World War I e served as a major in the 155th Coast Artillery.

A member of the staff of St. Francis Hospital, B k-enridge, and the Lake Region Hospital, Fergus Fall ne also served as civil defense chairman for his comm ty and as a member of the Red Cross board. He w a member of the Campbell school board for many y rs, a member of the Masonic Lodge of Campbell, the V.W. and the American Legion.

Dr. Wray belonged to the Park Region District nd County Medical Society, the Minnesota State Me cal Association and the American Medical Association.

In 1947, staff members of St. Francis Hospital, B k-enridge, and their wives honored Dr. Wray at a bar e on the occasion of his completion of fifty years of dical service.

Survivors include his daughter, Dorothy; his s er Mrs. R. S. Cheney, Kerrville, Texas; and his bro er, Edward, Evanston, Illinois. A son, William Edgar, re ceded him in death in 1922 and Mrs. Wray died an-uary 15, 1956.

Meetings and Announcements

EDICAL MEETINGS

ate

MINNESOTA STATE MEDICAL ASSOCIATION, nual meeting, Mayo Civic Auditorium, Rochester, ay 21-23, 1956.

Minnesota Society of Obstetrics and Gynecology, fall eting, Rochester, Minnesota, September 22. Dr. Ed- rd A. Banner, secretary, Rochester, Minnesota.

Northwest Pediatric Society, spring meeting, Roches- r, May 22, in conjunction with meeting of Minnesota ate Medical Association. Secretary, Dr. T. C. Paper- ıster, Minneapolis.

ational

American Association of Blood Banks, ninth annual eting, Somerset Hotel, Boston, Massachusetts, Sep- mber 3-5. Secretary Marjorie Saunders, 725 Doc- rs Building, 3707 Gaston Ave., Dallas, Texas.

American Cancer Society and National Cancer Insti- te, Third National Cancer Conference, Sheraton-Cad- ac Hotel, Detroit, Michigan, June 4-6. Write National ancer Conferences Coordinator, American Cancer So- ety, 521 West 57th Street, New York 19, New York.

American Ophthalmological Society, Hot Springs, Vir- nia, May 31 to June 2.

Medical Library Association, fifty-fifth annual meeting, otel Statler, Los Angeles, California, June 18-22. Write rs. Ella Crandall, Libraian, Los Angeles, County Gen- al Hospital, 1200 North State Street, Los Angeles 33, alifornia.

Microbiological Institute, ninth annual meeting, De- artment of Biological Sciences, Purdue University, afayette, Indiana, June 4-9. Write Division of Adult ducation, Engineering Administration Building, Purdue niversity, Lafayette, Indiana.

Minnesota-Dakota-Manitoba Orthopedic Society, an- ıal meeting, Red Wing, Minnesota, September 7 and 8. r. Hollis Ahlrin, secretary, Rapid City, South Dakota.

Symposium for General Practitioners on Tuberculosis ıd Other Chronic Pulmonary Diseases, fifth annual ieeting, Saranac Lake, New York, July 7-13. Dr. Ed- ard N. Packard, general chairman, Symposium for eneral Practitioners, P.O. Box 262, Saranac Lake, ew York.

Third National Cancer Conference, Detroit, Michigan, ıne 4-6.

West Virginia State Medical Association, 89th annual ieeting, The Greenbrier, White Sulphur Springs, West irginia, August 23-25.

International

Canadian Medical Association, Quebec, P.Q., Canada, June 10-14. Dr. Arthur D. Kelly, secretary, 150 St. George St., Toronto 5., Ontario, Canada.

Congress of International Society of Hematology, Hotel Somerset, Boston, Massachusetts, August 27-September 1. Dr. W. C. Moloney, secretary, 39 Bay State Road, Boston, Massachusetts.

European Congress of Cardiology, Stockholm, Sweden, September 10-14. Dr. Karl E. Grewin, secretary, Sodersjukhuset, Stockholm, Sweden.

Inter-American Congress of Cardiology, Havana, Cuba, November 4-10. Dr. Ramon Aixala, Apartado 2108, Havana, Cuba.

International College of Surgeons, European meetings: Paris, May 10; Nantes, May 14; Berne, May 17; Rome, May 23; Vienna, May 30.

International Congress of Clinical Chemistry, Hotel New Yorker, New York, September 9-14. Secretary, John G. Reinhold, 711 Maloney Building, University of Pennsylvania, Philadelphia 4, Pennsylvania.

International Congress of Gastroenterology, London, England, July 18-21. Herman Taylor, secretary, London Hospital, White Chapel, London E. 1, England.

International Congress of Internal Medicine, Madrid, Spain, September 19-23. Dr. J. C. DeOya, secretary, No. 90, Madrid, Spain.

International Congress of International College of Surgeons, Palmer House, Chicago, Illinois, September 9-13. Dr. Max Thorek, secretary general, 1516 Lake Shore Drive, Chicago, Illinois.

International Congress of Radiology, Mexico, D. F., Mexico, July 22-28. Dr. Jose Noriega, secretary, Tepic 126 (2 e piso), Mexico, D. F. 7, Mexico.

International Congress of World Confederation for Physical Therapy, Statler Hotel, New York, New York, June 17-23 Mildred Elson, American Physical Therapy Association, 1790 Broadway, New York 19, New York.

International Congress on Diseases of the Chest, Cologne, Germany, August 19-23. Murray Kornfeld, executive director, 112 East Chestnut St., Chicago 11, Illinois.

Pan American Congress on Cancer Cytology, Miami, Florida, January 8-12, 1957. Dr. J. Ernest Ayre, chairman, 1155 N. W. 14th St., Miami, Florida.

World Medical Association, Havana, Cuba, October 9-15. Dr. Louis H. Bauer, secretary general, 345 East 46th St., New York 17, New York.

AMERICAN CANCER SOCIETY FELLOWSHIPS

The American Cancer Society has announced that its program of clinical fellowships, which began in 1948, will continue through the institutional years, July 1, 1957 to June 30, 1958, with fellowships commencing July 1, 1957. Applications for fellowships should be sent to Dr. Brewster S. Miller, American Cancer Society, 521 West 57th Street, New York 19, New York, via the executive officer of the teaching institution.

AMERICAN COLLEGE OF GASTROENTEROLOGY ANNOUNCES WRITING CONTEST

The American College of Gastroenterology, in cooperation with the Ames Company of Elkhart, Indiana, announces the 1956 Ames Award contest for the best papers in gastroenterology.

For fellows in gastroenterology, residents and internes the first prize will be $500, with a second prize of $250. In addition a prize of $250 will be given for the best paper published in the *American Journal of Gastroenterology* during the year ending June 30. Papers must be submitted before July 15.

For further information, write the American College of Gastroenterology, 33 West 60th Street, New York 23, New York.

MINNESOTA ACADEMY OF OPHTHALMOLOGY AND OTOLARYNGOLOGY

New officers of the Minnesota Academy of Ophthalmology and Otolaryngology for 1956-1957 are Dr. Karl E. Sandt. Minneapolis, president; Dr. John Peterson, Duluth. first vice president; Dr. John Erick, Rochester, second vice president; Dr. Malcolm McCannel. Minneapolis, secretary-treasurer.

Chairman of the council is Dr. George Tangen, Minneapolis, and members of the council include Dr. John Wendland, Dr. Walter Fink, Dr. Sandt and Dr. McCannel, all of Minneapolis; Dr. Frank Adair, St. Paul, and Dr. Hobart Johnson, Mankato.

The organization meets on the second Friday of the month from November to May, alternating between the Minneapolis Club in Minneapolis and the Minnesota Club in St. Paul.

CAMP COURAGE OPENS IN JUNE

Camp Courage. Minnesota's only camp especially designed for physically handicapped children and adults, opens its second season June 17.

The camp is maintained by the Minnesota Society for Crippled Children and Adults (the Easter Seal Society). Located on Cedar Lake, about four miles northwest of Minneapolis, it offers regular activities as well as speech and physical therapy on recommendation from a physician. A trained occupational therapist administers the arts and crafts program.

The camp is open to all types of physically handicapped children and adults, including those who are blind, deaf or have speech problems. Minimum age is eight. At present, the camp is not accepting children who are mentally retarded or emotionally disturbed. Epileptics, diabetics and enuretics are screened and evaluated on individual merit by an admissions committee upon medical recommendation. No one is ever refused admission because of race, creed, color or inability to pay.

Physicians knowing prospective campers should contact their local Easter Seal chairman or Toy Jambeck, Camp Director, Easter Seal Society, 1639 Hennepin Ave., Minneapolis 3, Minnesota.

Woman's Auxiliary

BABY SITTER PROJECT FOR ST. LOUIS COUNTY AUXILIARY

Mrs. L. J. Leonard

A Duluth project which stimulated considerable int-
est was presented by Mrs. H. E. Bakkila during the M
Winter Board meeting in Saint Paul.

The Home Safety Committee of the Duluth Woma
Institute formed a Baby Sitters' Council in 1950 to m
the need to educate baby sitters in safety matters. T
St. Louis County Medical Auxiliary was approached w
the problem and agreed to participate in the program.

The Auxiliary supplied printed cards, about 8 x
inches, in the form of a bulletin which could be tack
on the wall of the home in a conspicuous spot. T
card gave these six emergency facts in bold type—w
proper telephone numbers and other instructions:

1. Parents' name and address where they could
   reached; also where else to get help in emergenc
2. Serious injury to the baby.
3. Fire.
4. Sudden sickness.
5. Choking.
6. Gas, water or light failure.

These cards were given to all attending the ann
Baby Sitters' workshops which have been held since 19

From a group of 180 at the first workshop, the numl
has increased to the point where the last two meeti
have been held at the Shrine auditorium. Attending v
a capacity-size group of baby sitters and interested adu

Stunts, movies, door prizes and group singing ha
been added to the programs to stimulate interest.

By constant repetition of safety rules, the sponsors ho
to train more competent and more responsible ba
sitters.

Inquiries on the operation of this plan have been
ceived from all over the United States.

Members of the St. Louis County Auxiliary are to
commended for their participation in this program a
for their contribution to its success.

NATIONAL CONVENTION

Mrs. G. E. Harmon, State Auxiliary Publicity Ch
man, has received a letter from Margaret Wolf, natio
Executive Secretary, extending a cordial invitation
Auxiliary members to participate in all social funct
and Auxiliary sessions of the national convention, J
11-15, in Chicago. Headquarters will be at the Conr
Hilton Hotel. Tickets for all functions will be availa
only at the registration desk. There will be a hospita
room in the Normandy Lounge.

Mrs. Harmon has studied the program and states t
it looks very interesting and most worthwhile.

Minnesota State Medical Association Roster for 1956

Officers

H. Wilson, M.D.	*President*	Winona
rdon C. MacRae, M.D.	*First Vice President*	Duluth
ncel T. Mitchell, M.D.	*Second Vice President*	Minneapolis
B. Souster, M.D.	*Secretary*	Saint Paul
H. Condit, M.D.	*Treasurer*	Minneapolis
G. Sheppard, M.D.	*Speaker, House of Delegates*	Hutchinson
M. Carryer, M.D.	*Vice Speaker, House of Delegates*	Rochester
R. Rosell	*Executive Secretary*	Saint Paul

Councilors

(Terms expire December 31 of year indicated)

st District

M. Stickney, M.D. (1956)	Rochester

ond District

R. C. Hunt, M.D. (1956)	Fairmont

ird District

P. E. Hermanson, M.D. (1958)	Hendricks

urth District

H. J. Nilson, M.D. (1957)	North Mankato

Fifth District

L. R. Critchfield, M.D. (1958)	Saint Paul

Sixth District

H. B. Sweetser, M.D. (1957)	Minneapolis

Seventh District

W. W. Will, M.D. (1958)	Bertha

Eighth District

C. L. Oppegaard, M.D. (1957) Chairman	Crookston

Ninth District

Clarence Jacobson, M.D. (1956)	Chisholm

House of Delegates, American Medical Association

embers

J. Arnold Bargen, M.D. (1956)	Rochester
O. J. Campbell, M.D. (1957)	Minneapolis
George Earl, M.D. (1957)	Saint Paul
F. J. Elias, M.D. (1956)	Duluth

Alternates

Paul C. Leck, M.D. (1956)	Austin
C. L. Oppegaard, M.D. (1957)	Crookston
E. M. Hammes, Sr., M.D. (1957)	Saint Paul
A. O. Swenson, M.D. (1956)	Duluth

Scientific Committees

ANESTHESIOLOGY

H. Seldon, M.D.	Rochester
argaret C. Anderson, M.D.	Mankato
W. Baird, M.D.	Minneapolis
H. Crowley, M.D.	Saint Paul
C. Gaard, M.D.	Minneapolis
C. Jacobson, M.D.	Duluth
obert C. Knutson, M.D.	Saint Paul
hn E. Osborn, M.D.	Rochester

BLOOD AND BLOOD BANKS

S. Lundy, M.D.	Rochester
ul F. Dwan, M.D.	Minneapolis
W. Edwards, M.D.	Saint Paul
V. Goltz, M.D.	Saint Paul
m. V. Knoll, M.D.	Brainerd
W. Koucky, M.D.	Minneapolis
onald J. Nollett, M.D.	Hibbing
C. Plimpton, M.D.	Minneapolis
oward M. Wikoff, M.D.	Crookston

CANCER

(Three-year appointment)

David P. Anderson, Jr., M.D. (1958)	Austin
P. F. Eckman, M.D. (1958)	Duluth
G. F. Hartnagel, M.D. (1956)	Red Wing
Paul Heise, M.D. (1958)	Winona
C. R. Hitchcock, M.D. (1956)	Minneapolis
N. K. Jensen, M.D. (1958)	Minneapolis
Leonard A. Lang, M.D. (1958)	Minneapolis
N. Logan Leven, M.D., (1956)	Saint Paul
T. B. Magath, M.D. (1956)	Rochester
F. M. Owens, Jr., M.D. (1958)	Saint Paul
D. E. Stewart, M.D. (1958)	Crookston

CHILD HEALTH

G. B. Logan, M.D.	Rochester
Eldon Berglund, M.D.	Minneapolis
T. C. Chisholm, M.D.	Minneapolis
J. J. Galligan, M.D.	Saint Paul
O. H. Jones, M.D.	Mankato

Charles W. Rogers, M.D.	Winona
A. B. Rosenfield, M.D.	Minneapolis
V. O. Wilson, M.D.	Rochester
Edward Zupanc, M.D.	Duluth

CONSERVATION OF HEARING

K. M. Simonton, M.D.	Rochester
L. R. Boies, M.D.	Minneapolis
John H. Cameron, M.D.	Crookston
C. E. Connor, M.D.	Saint Paul
J. B. Gaida, M.D.	St. Cloud
Anderson Hilding, M.D.	Duluth
Conrad J. Holmberg, M.D.	Minneapolis
J. Donald Sjoding, M.D.	Mankato

DIABETES

J. R. Meade, M.D.	Saint Paul
Moses Barron, M.D.	Minneapolis
J. J. Boehrer, M.D.	Minneapolis
J. J. Eustermann, M.D.	Mankato
D. R. Gillespie, M.D.	Saint Paul
Robert E. Hansen, M.D.	Hibbing
L. L. Merriman, M.D.	Duluth
E. H. Rynearson, M.D.	Rochester
R. V. Sherman, M.D.	Red Wing
Harvey E. Sisk, M.D.	St. Cloud

FIRST AID AND RED CROSS

J. S. Lundy, M.D.	Rochester
Elizabeth C. Bagley, M.D.	Duluth
C. F. Brigham, Jr., M.D.	St. Cloud
J. W. Edwards, M.D.	Saint Paul
B. A. Flesche, M.D.	Lake City
E. V. Goltz, M.D.	Saint Paul
D. L. Jacobs, M.D.	Willmar
J. J. Kolars, M.D.	Faribault
W. F. Nordman, M.D.	Mora
E. H. O'Phelan, M.D.	Minneapolis
J. C. Vezina, M.D.	Mapleton

FRACTURES

E. T. Evans, M.D.	Minneapolis
N. H. Baker, M.D.	Fergus Falls
W. H. Cole, M.D.	Saint Paul
Robert B. Engstrom, M.D.	Mankato
T. P. Groschupf, M.D.	Bemidji
V. P. Hauser, M.D.	Saint Paul
John C. Ivins, M.D.,	Rochester
W. J. McDonald, M.D.	Crookston
J. H. Moe, M.D.	Minneapolis
Harry B. Neel, M.D.	Albert Lea
M. J. Nydahl, M.D.	Minneapolis
A. B. Roehlke, M.D.	Elk River
W. A. Swedberg, M.D.	Duluth

GENERAL PRACTICE

H. E. Drill, M.D.	Hopkins
E. C. Bayley, M.D.	Lake City
Chas. C. Cooper, M.D.	Saint Paul
H. E. Coulter, M.D.	Madelia
Donald C. Deters, M.D.	Saint Paul
C. S. Donaldson, M.D.	St. Cloud
R. J. Eckman, M.D.	Duluth
W. E. Hart, M.D.	Monticello
H. P. Hinderaker, M.D.	Bird Island
Gerald Larson, M.D.	Cambridge
W. W. Rieke, M.D.	Wayzata

GERIATRICS AND CHRONIC ILLNESS

Leo A. Nash, M.D.	Saint Paul
C. A. Anderson, M.D.	Hector
R. H. Conley, M.D.	Mankato
John Leo Delmore, Jr., M.D.	Roseau
Albert J. Greenberg, M.D.	Minneapolis
O. M. Heiberg, M.D.	Worthington
John A. Lepak, M.D.	Saint Paul
Walter S. Neff, M.D.	Virginia

HEART

(Three-year appointment)

F. J. Hirschboeck, M.D. (1958)	Dulu
J. F. Borg, M.D. (1958)	Saint Pa
J. F. Briggs, M.D. (1956)	Saint Pa
Hendrik DeKruif, M.D. (1958)	Fergus Fa
Paul F. Dwan, M.D. (1958)	Minneapo
C. N. Hensel, M.D. (1958)	Saint Pa
M. M. Hurwitz, M.D.(1956)	Saint Pa
R. O. Sather, M.D. (1958)	Crookst
H. L. Smith, M.D. (1958)	Rochest
Chester Thiem, M.D. (1956)	Manka
D. W. Wheeler, M.D. (1958)	Dulu
Asher A. White, M.D. (1958)	Minneapo

HISTORICAL

Robert Rosenthal, M.D.	Saint Pa
Richard Bardon, M.D.	Dulu
W. F. Braasch, M.D.	Rochest
L. H. Flancher, M.D.	Crookst
Carl Fritsche, M.D.	New U
Walter H. Halloran, M.D.	Jacks
A. J. Lewis, M.D.	Henni
A. G. Liedloff, M.D.	Manka
Thos. A. Peppard, M.D.	Minneapo
A. M. Watson, M.D.	Royalt
W. E. Wilson, M.D.	Northfie

HOSPITALS AND MEDICAL EDUCATION

H. S. Diehl, M.D.	Minneapo
T. E. Broadie, M.D.	Saint Pa
B. C. Ford, M.D.	Marsh
A. C. Kerkhof, M.D.	Minneapo
Henry A. Korda, M.D.	Pelican Rap
Arnold Larson, M.D.	Detroit Lak
John P. Medelman, M.D.	Saint Pa
P. F. Meyer, M.D.	Fariba
H. J. Walder, M.D.	Dulu
E. E. Wollaeger, M.D.	Rochest
L. I. Younger, M.D.	Wino

INDUSTRIAL HEALTH

L. W. Foker, M.D.	Minneapo
Tracy E. Barber, Jr., M.D.	Aust
John D. Barker, M.D.	Dulu
C. C. Bell, M.D.	Saint Pa
H. B. Clark, M.D.	St. Clo
T. A. Lowe, M.D.	South Saint Pa
O. L. McHaffie, M.D.	Dulu
W. E. Park, M.D.	Minneapo
John W. Raattama, M.D.	Nashwa
Edward Schons, M.D.	Saint Pa
J. F. Shronts, M.D.	Minneapo
H. H. Young, M.D.	Roches

MATERNAL HEALTH

J. J. Swendson, M.D.	Saint Pa
P. N. Bray, M.D.	Dulu
J. F. DuBois, Jr., M.D.	Sauk Cen
John Faber, M.D.	Roches
G. F. Hartnagel, M.D.	Red Wi
John A. Haugen, M.D.	Minneapo
J. L. McKelvey, M.D.	Minneapo
W. F. Mercil, M.D.	Crookst
Mancel T. Mitchell, M.D.	Minneapo
Pat Rollins, M.D.	St. Char
A. B. Rosenfield, M.D.	Minneapo
E. C. Sargent, M.D.	Aus
F. L. Schade, M.D.	Worthingt
A. O. Swenson, M.D.	Dul

MEDICAL TESTIMONY

E. M. Hammes, Sr., M.D.	Saint P
Mark B. Coventry, M.D.	Roches
A. J. Leemhuis, M.D.	Minneapo
L. H. Rutledge, M.D.	Detroit La
G. J. Strewler, M.D.	Dul
W. G. Workman, M.D.	Tr

MILITARY AFFAIRS

E. Johnson, M.D.	Duluth
G. Benjamin, M.D.	Minneapolis
oyd M. Burns, M.D.	Milan
lius E. Haes, M.D.	Mankato
H. Lufkin, M.D.	Minneapolis
nald McCarthy, M.D.	Saint Paul
P. Ritchie, M.D.	Saint Paul
eph M. Ryan, M.D.	Saint Paul
in T. Smiley, M.D.	Minneapolis
K. Stratte, M.D.	Pine City
nard Street, M.D.	Northfield
H. Tillisch, M.D.	Rochester

NERVOUS AND MENTAL DISEASES

P. Gardner, M.D.	Saint Paul
R. Brown, M.D.	Rochester
S. Chalgren, M.D.	Mankato
J. Engberg, M.D.	Faribault
E. T. Haavik, M.D.	Duluth
M. Hammes, Jr., M.D.	Saint Paul
B. Hannah, M.D.	Minneapolis
man S. Lippman, M.D.	Saint Paul
rold H. Noran, M.D.	Minneapolis
L. Patterson, M.D.	Fergus Falls
ul Reed, M.D.	Virginia

OPHTHALMOLOGY

R. Fritsche, M.D.	New Ulm
F. Adair, Jr., M.D.	Saint Paul
W. Grant, M.D.	Saint Paul
W. Hansen, M.D.	Minneapolis
bart C. Johnson, M.D.	Mankato
N. Knapp, M.D.	Duluth
orge L. Loomis, M.D.	Winona
W. Rucker, M.D.	Rochester
R. Schweiger, M.D.	Hibbing
E. Stanford, M.D.	Minneapolis
T. Wenner, M.D.	St. Cloud
H. Monahan, M.D.	Saint Paul
lcolm McCannel, M.D.	Minneapolis

PUBLIC HEALTH NURSING

McC. Fischer, M.D.	Duluth
F. Brigham, Jr., M.D.	St. Cloud
W. C. Chambers, M.D.	Blue Earth
Luther F. Davis, M.D.	Wadena
Helen L. Knudsen, M.D.	Minneapolis
C. E. Merkert, M.D.	Minneapolis
R. B. J. Schoch, M.D.	Saint Paul
Theodore W. Stransky, M.D.	Owatonna

SYPHILIS AND SOCIAL DISEASES

H. G. Irvine, M.D.	Minneapolis
L. A. Brunsting, M.D.	Rochester
John A. Butzer, M.D.	Mankato
W. E. Hatch, M.D.	Duluth
George W. Hauser, M.D.	Minneapolis
F. W. Lynch, M.D.	Saint Paul
H. E. Michelson, M.D.	Minneapolis
C. W. Moberg, M.D.	Detroit Lakes
J. F. Schmid, M.D.	Duluth

TUBERCULOSIS

J. F. Briggs, M.D.	Saint Paul
J. A. Myers, M.D., Vice Chairman	Minneapolis
R. N. Barr, M.D.	Minneapolis
Ezra V. Bridge, M.D.	Cannon Falls
F. F. Callahan, M.D.	Saint Paul
S. S. Cohen, M.D.	Oak Terrace
Dean S. Fleming, M.D.	Hopkins
Corrin H. Hodgson, M.D.	Rochester
L. S. Jordan, M.D.	Granite Falls
John P. Medelman, M.D.	Saint Paul
E. A. Meyerding, M.D.	Saint Paul
W. E. Peterson, M.D.	Willmar
G. G. Sheppard, M.D.	Hutchinson
S. A. Slater, M.D.	Worthington
Lyle A. Tongen, M.D.	Saint Paul

VACCINATION AND IMMUNIZATION

R. N. Barr, M.D.	Minneapolis
E. E. Barrett, M.D.	Duluth
Luther Davis, M.D.	Wadena
L. E. Harris, M.D.	Rochester
C. O. Kohlbry, M.D.	Duluth
R. B. J. Schoch, M.D.	Saint Paul
C. S. Strathern, M.D.	St. Peter
R. L. Wilder, M.D.	Minneapolis

Non-Scientific Committees

EDITING AND PUBLISHING

M. Hammes, Sr., M.D.	Saint Paul
ederick M. Owens, Jr., M.D.	Saint Paul
A. Peppard, M.D.	Minneapolis
L. Ulrich, M.D.	Minneapolis
H. Wells, M.D. *(Ex officio)*	Duluth

BOARD OF EDITORS

H. Wells, M.D., Editor	Duluth
uart W. Arhelger, M.D.	Minneapolis
hn F. Briggs, M.D.	Saint Paul
F. Ceplecha, M.D.	Redwood Falls
gue C. Chisholm, M.D.	Minneapolis
bert B. Howard, M.D.	Minneapolis
land Drew Miller, M.D.	Rochester
nry C. Moehring, M.D.	Duluth
enn J. Mouritsen, M.D.	Fergus Falls
live V. Seibert, B.A.	Saint Paul
orge G. Stilwell, M.D.	Rochester
M. Hammes, Sr., M.D. *(Ex officio)*	Saint Paul

HOSPITALS AND PROFESSIONAL RELATIONS

Allen Good, M.D.	Rochester
W. Behmler, M.D.	Morris
C. Bernstein, M.D.	Saint Paul
W. T. Greenfield, M.D.	Cokato
Kano Ikeda, M.D.	Saint Paul
K. E. Latterell, M.D.	Duluth
Thomas Lowry, M.D.	Minneapolis

INSURANCE LIAISON COMMITTEE

Corrin H. Hodgson, M.D.	Rochester
R. P. Buckley, M.D.	Duluth
John Dordal, M.D.	Sacred Heart
P. W. Harrison, M.D.	Worthington
Robert McGandy, M.D.	Minneapolis
Horatio Van Cleve, M.D.	Austin
Clarence W. Walter, M.D.	Saint Paul

INTERPROFESSIONAL RELATIONS

M. J. Anderson, M.D.	Rochester
H. G. Bosland, M.D.	Willmar
K. R. Fawcett, M.D.	Duluth
M. I. Hauge, M.D.	Clarkfield
G. M. B. Hawley, M.D.	Red Wing
E. A. Heiberg, M.D.	Fergus Falls
Elmer Lippmann, M.D.	Hutchinson
J. C. Mankey, M.D.	Minneapolis
M. J. McKenna, M.D.	Grand Rapids
R. F. Sturley, M.D.	Saint Paul

MALPRACTICE INSURANCE

A. E. Ritt, M.D.	Saint Paul
George W. Drexler, M.D.	Blue Earth
Owen McDonald, M.D.	Duluth
Harold E. Miller, M.D.	Minneapolis
M. E. Mosby, M.D.	Long Prairie
George E. Penn, M.D.	Mankato
L. F. Wasson, M.D.	Alexandria

MEDICAL ECONOMICS

George Earl, M.D., *General Chairman*	Saint Paul

Executive Committee

George Earl, M.D.	Saint Paul
F. J. Elias, M.D.	Duluth
W. H. Hengstler, M.D.	Saint Paul
Corrin H. Hodgson, M.D.	Rochester
William Proffitt, M.D.	Minneapolis
C. E. Proshek, M.D.	Minneapolis

Editorial Committee

George Earl, M.D.	Saint Paul
W. A. Merritt, M.D.	Rochester
W. L. Patterson, M.D.	Fergus Falls
H. F. R. Plass, M.D.	Minneapolis
A. H. Wells, M.D.	Duluth

Medical Advisory Committee

W. H. Hengstler, M.D.	Saint Paul
J. B. Beuning, M.D.	St. Cloud
Mark B. Coventry, M.D.	Rochester
P. G. E. Hoeper, M.D.	Mankato
D. C. MacKinnon, M.D.	Minneapolis
G. C. MacRae, M.D.	Duluth
Harvey Nelson, M.D.	Minneapolis

Medical Service

William Proffitt, M.D.	Minneapolis
F. S. Babb, M.D.	Saint Paul
C. M. Bagley, M.D.	Duluth
Tague C. Chisholm, M.D.	Minneapolis
Wm. M. Feigal, M.D.	Thief River Falls
L. M. Hammar, M.D.	Mankato
Frank J. Heck, M.D.	Rochester
B. G. Lannin, M.D.	Saint Paul
F. W. Lynch, M.D.	Saint Paul
R. A. Murray, M.D.	Hibbing
Harry B. Neel, M.D.	Albert Lea
James P. O'Keefe, M.D.	St. Cloud
H. F. R. Plass, M.D.	Minneapolis

State Health Relations

C. E. Proshek, M.D.	Minneapolis
R. W. Barr, M.D.	Montevideo
B. J. Bouquet, M.D.	Wabasha
John Earl, M.D.	Saint Paul
J. J. Eustermann, M.D.	Mankato
Fred N. Grose, M.D.	Clarissa
Raymond J. Jackman, M.D.	Rochester
Samuel N. Litman, M.D.	Duluth
C. N. McCloud, Jr., M.D.	Saint Paul
D. R. Mueller, M.D.	Bagley
R. H. Puumala, M.D.	Cloquet
Carl Simison, M.D.	Barnesville

MEDICAL ETHICS

Harry Klein, M.D.	Duluth
John E. Holt, M.D.	Saint Paul
T. J. Kinsella, M.D.	Minneapolis
George E. Penn, M.D.	Mankato
Harry M. Weber, M.D.	Rochester

MEMBERSHIP COMMITTEE

H. F. R. Plass, M.D.	Minneapolis
H. M. Carryer, M.D.	Rochester
John W. Gridley, M.D.	Arlington
Carl Lundell, M.D.	Granite Falls
H. R. Thysell, M.D.	Crooks
M. O. Wallace, M.D.	Dul
B. A. Weis, M.D.	Saint P

PHYSICIANS' ASSISTANCE

W. R. Humphrey, M.D.	Stillwa
Walter G. Benjamin, M.D.	Pipest
James A. Blake, M.D.	Hopk
Paul G. Boman, M.D.	Dul
John Dordal, M.D.	Sacred He
Richard B. Graves, M.D.	Red W
Donald E. Hoganson, M.D.	Bem
Rolf Hovde, M.D.	Winth
L. W. Johnsrud, M.D.	Hibb
Herman M. Juergens, M.D.	Belle Pla
E. A. Kilbride, M.D.	Worthing
W. E. Macklin, Jr., M.D.	Will
Leo A. Nash, M.D.	Saint P
Raymond L. Page, M.D.	St. Cha
E. R. Sather, M.D.	Alexan
C. G. Sheppard, M.D.	Hutchin
Wm. F. Skaife, M.D.	Little F
M. D. Starekow, M.D.	Thief River F

PUBLIC HEALTH EDUCATION

F. J. Elias, M.D., *General Chairman*	Du

Executive Committee

F. J. Elias, M.D.	Du
R. M. Burns, M.D.	Saint P
H. M. Carryer, M.D.	Roche
A. H. Wells, M.D.	Dul

(And Chairmen of all Scientific Committees)

Editorial

A. H. Wells, M.D.	Dul
K. W. Anderson, M.D.	Minneap
G. W. Clifford, M.D.	Alexan
T. J. Edwards, M.D.	Saint
Andrew V. Grinley, M.D.	Grand Ra
H. W. Schmidt, M.D.	Roche

Radio and Television

R. M. Burns, M.D.	Saint
Elizabeth C. Bagley, M.D.	Du
David Carr, M.D.	Roche
L. N. Dale, M.D.	Red Lake F
James Rogers Fox, M.D.	Minneap
O. M. Heiberg, M.D.	Worthing
L. R. Prins, M.D.	Albert
H. J. Reif, M.D.	St. Cl
A. A. Schmitz, M.D.	Mank
Lewis J. Wilson, M.D.	Win

Speakers' Bureau

H. M. Carryer, M.D.	Roche
W. C. Dodds, M.D.	Detroit L
J. W. Duncan, M.D.	Moorh
Ben R. Geurs, M.D.	Man
P. A. Lommen, M.D.	Au
O. L. N. Nelson, M.D.	Minnea
E. Irvine Parson, M.D.	Du
Charles Rea, M.D.	Saint
W. B. Wells, M.D.	Jac
Harold E. Wilmot, M.D.	Litch

RURAL MEDICAL SERVICE

First District

Paul C. Leck, M.D., *Chairman*	Au

Second District

V. W. Doman, M.D.	Lake

Third District

L. J. Monson, M.D.	C

Fourth District

Lawrence Sjostrom, M.D.	St.

Fifth District

K. Stratte, M.D.	Pine City

Sixth District

W. Rifke, M.D.	Wayzata

Seventh District

E. Fitzsimons, M.D.	Brainerd

Eighth District

W. Jacobson, M.D.	Breckenridge

Ninth District

K. Butler, M.D.	Cloquet

RAL MEDICAL SCHOLARSHIP COMMITTEE

J. Elias, M.D.	Duluth
G. Sheppard, M.D.	Hutchinson
J. Simons, M.D.	Saint Paul

UNIVERSITY RELATIONS

O. Swenson, M.D.	Duluth
J. Campbell, M.D.	Minneapolis
as. C. Cooper, M.D.	Saint Paul
J. Elias, M.D.	Duluth
stus Ohage, M.D.	Saint Paul

COMMITTEE ON VETERANS AFFAIRS

van Sach-Rowitz, M.D.	Moose Lake
Erickson, M.D.	Long Prairie
J. Eustermann, M.D.	Mankato
J. E. Murphy, M.D.	Marshall
E. I. Parson, M.D.	Duluth
P. H. Soucheray, M.D.	Saint Paul
C. H. Watkins, M.D.	Rochester

AMERICAN MEDICAL EDUCATION FOUNDATION COMMITTEE

C. E. Rea, M.D., *Chairman*	Saint Paul
First Councilor District	W. A. Merritt, M.D., Rochester
Second Councilor District	Maurice D. Cooper, M.D., Winnebago
Third Councilor District	A. W. Diessner, M.D., Redwood Falls
Fourth Councilor District	John J. Eustermann, M.D., Mankato
Fifth Councilor District	Joseph L. Sprafka, M.D., Saint Paul
Sixth Councilor District	Charles A. Neumeister, M.D., Minneapolis
Seventh Councilor District	Wilford J. Deweese, M.D., Bemidji
Eighth Councilor District	M. D. Starekow, M.D., Thief River Falls
Ninth Councilor District	R. T. Seashore, M.D., Duluth

Councilor Districts

FIRST DISTRICT

M. Stickney, M.D. .... Rochester
Counties—Dodge, Fillmore, Goodhue, Houston, Mower, Olmsted, Rice, Steele, Wabasha, Winona

SECOND DISTRICT

C. Hunt, Sr., M.D. .... Fairmont
Counties—Cottonwood, Faribault, Freeborn, Jackson, Martin, Murray, Nobles, Pipestone, Rock, Watonwan

THIRD DISTRICT

E. Hermanson, M.D. .... Hendricks
Counties—Big Stone, Chippewa, Kandiyohi, Lac Qui Parle, Lincoln, Lyon, Meeker, Pope, Redwood, Renville, Stevens, Swift, Traverse, Yellow Medicine

FOURTH DISTRICT

J. Nilson, M.D. .... North Mankato
Counties—Blue Earth, Brown, Carver, Le Sueur, McLeod, Nicollet, Scott, Sibley, Waseca

FIFTH DISTRICT

L. R. Critchfield, M.D. .... Saint Paul
Counties—Anoka, Chisago, Dakota, Isanti, Kanabec, Mille Lacs, Pine, Ramsey, Sherburne, Washington

SIXTH DISTRICT

H. B. Sweetser, M.D. .... Minneapolis
Counties—Hennepin, Wright

SEVENTH DISTRICT

W. W. Will, M.D. .... Bertha
Counties—Aitkin, Beltrami, Benton, Cass, Clearwater, Crow Wing, Hubbard, Koochiching, Morrison, Stearns, Todd, Wadena

EIGHTH DISTRICT

C. L. Oppegaard, M.D. .... Crookston
Counties—Becker, Clay, Douglas, Grant, Kittson, Lake of the Woods, Mahnomen, Marshall, Norman, Otter Tail, Pennington, Polk, Red Lake, Roseau, Wilkin

NINTH DISTRICT

Clarence Jacobson, M.D. .... Chisholm
Counties—Carlton, Cook, Itasca, Lake, St. Louis

County Medical Advisory Committees

AITKIN COUNTY

F. C. Closuit	Aitkin
H. T. Petraborg	Aitkin

ANOKA COUNTY

R. J. Spurzem	Anoka
M. K. Plasha	Anoka
Frank Mork	Anoka

BECKER COUNTY

Arnold Larson	Detroit Lakes
Arvid Houglum	Lake Park

BELTRAMI COUNTY

T. P. Groschupf	Bemidji
H. A. Palmer	Blackduck
D. D. Whittemore	Bemidji

BIG STONE COUNTY

I. L. Oliver	Graceville
Otto Bergan	Clinton
H. H. Hedemark	Ortonville

BLUE EARTH COUNTY

Hugh Morgan	Amboy
George Penn	Mankato
P. G. Hoeper	Mankato

BROWN COUNTY

Albert Fritsche	New Ulm
C. A. Saffert	New Ulm
O. B. Fesenmaier	New Ulm

CARLTON COUNTY

J. K. Butler	Cloquet
R. M. Eppard	Cloquet
E. O. Hanson	Cloquet

CARVER COUNTY

G. T. Schimelpfenig	Chaska
Leighton Larson	Waconia
John Clarke	Watertown

CASS COUNTY

O. F. Ringle	Walker
C. H. Coombs	Cass Lake

CHIPPEWA COUNTY

H. A. Roust	Montevideo
F. M. Burns	Milan
L. R. Lima, Jr.	Montevideo
J. H. Allen	Montevideo

CHISAGO COUNTY

J. E. Halpin	Rush City

CLAY COUNTY

J. W. Duncan	Moorhead
V. D. Thysell	Hawley

CLEARWATER COUNTY

L. J. Larson	Bagley
W. E. Anderson	Clearbrook

COOK COUNTY

W. R. Smith	Grand Mara

COTTONWOOD COUNTY

H. C. Stratte	Windo
E. S. Schutz	Mountain La
J. V. Carlson	Westbro

CROW WING COUNTY

V. E. Quanstrom	Braine
G. I. Badeaux	Braine
J. B. Nixon	Cros

DAKOTA COUNTY

Bernice Thoreson	South St. Pa
H. J. Just	Hastin
A. H. Field	Farmingt

DODGE COUNTY

C. E. Bigelow	Dodge Cent
D. E. Affeldt	Kass
G. E. Olson	West Conco

DOUGLAS COUNTY

E. E. Emerson	Osa
G. W. Clifford	Alexand
E. R. Sather	Alexand

FARIBAULT COUNTY

W. C. Chambers	Blue Ear
M. D. Cooper	Winneba
Richard Virnig	We

FILLMORE COUNTY

H. M. Skaug	Chatfi
L. W. Clark	Spring Vall
J. P. Nehring	Prest

FREEBORN COUNTY

L. C. Barr	Albert L
C. E. J. Nelson	Albert L
A. G. Sherman	Albert L
Catherine Burns	Albert L

GOODHUE COUNTY

R. B. Graves	Red W
W. W. Liffrig	Red W
G. F. Hartnagel	Red W

GRANT COUNTY

L. R. Parson	Elbow L
J. H. Cain	Hoff

HENNEPIN COUNTY

Silas C. Andersen	Minneap
Arthur A. Wohlrabe	Minneap
Bernard I. Saliterman	Minneap
Robert D. Semsch	Minneap
L. Raymond Scherer	Minneap
Lloyd F. Sherman	Minneap
Nathan K. Jensen	Minneap
E. Harvey O'Phelan	Minneap

HOUSTON COUNTY

T. Norris .... Caledonia
K. Onsgard .... Houston
A. Knutson .... Spring Grove

HUBBARD COUNTY

nald Houston .... Park Rapids
W. Higgs .... Park Rapids
n Eiler .... Park Rapids

ISANTI COUNTY

T. Nygren .... Braham

ITASCA COUNTY

K. Rowles .... Coleraine
M. Erskine .... Grand Rapids
J. McKenna .... Grand Rapids

JACKSON COUNTY

T. Rose .... Lakefield
A. Christiansen .... Jackson
H. Halloran .... Jackson

KANABEC COUNTY

F. Nordman .... Mora

KANDIYOHI COUNTY

. Jacobs .... Willmar
G. Bosland .... Willmar
H. Sutherland .... New London

KITTSON COUNTY

S. Berlin .... Hallock

KOOCHICHING COUNTY

D. Hanover .... International Falls
A. MacDonald .... Littlefork
C. Craig .... International Falls

LAC QUI PARLE COUNTY

T. Fallon .... Dawson
ester Anderson .... Madison

LAKE COUNTY

lph Papermaster .... Two Harbors

LAKE-OF-THE-WOODS

A. Brink .... Baudette

LINCOLN COUNTY

E. Hermanson .... Hendricks
L. Vadheim .... Tyler
H. Larson .... Lake Benton

LYON COUNTY

C. Ford .... Marshall
W. Yaeger .... Marshall
G. Workman .... Tracy

MARSHALL COUNTY

rle Holmstrom .... Warren

MARTIN COUNTY

R. C. Hunt .... Fairmont
C. W. Krause .... Fairmont
H. A. Williamson .... Fairmont
Anthony Ourada .... Fairmont
M. J. Lester .... Truman

McLEOD COUNTY

A. M. Jensen .... Brownton
E. W. Lippman .... Hutchinson

MEEKER COUNTY

Harold Wilmot .... Litchfield
Lennox Danielson .... Litchfield
G. M. Olson .... Litchfield

MILLE LACS COUNTY

A. T. Kapsner .... Princeton

MORRISON COUNTY

A. M. Watson .... Royalton
E. G. Knight .... Swanville
O. C. Bolstad .... Little Falls
M. L. Hansen .... Little Falls

MOWER COUNTY

L. F. Twiggs .... Austin
J. G. Havens .... Austin

MURRAY COUNTY

B. M. Stevenson .... Fulda
R. F. Pierson .... Slayton
H. D. Patterson .... Slayton

NICOLLET-LE SUEUR COUNTY

R. A. Curtis .... Le Center
H. J. Nilson .... North Mankato
M. E. Lenander .... St. Peter

NOBLES COUNTY

E. W. Arnold .... Adrian
E. A. Kilbride .... Worthington

NORMAN COUNTY

Byron Kinkade .... Ada

OLMSTED COUNTY

N. O. Hanson .... Rochester
E. A. Olson .... Pine Island
T. O. Wellner .... Rochester

OTTERTAIL COUNTY

C. A. Boline .... Battle Lake
W. O. B. Nelson .... Fergus Falls
C. W. Lewis .... Henning
Ralph Estrem .... Fergus Falls

PENNINGTON COUNTY

M. D. Starekow .... Thief River Falls

PINE COUNTY

A. K. Stratte	Pine City

PIPESTONE COUNTY

W. G. Benjamin	Pipestone
J. G. Lohmann	Pipestone
G. Beckering	Edgerton

POLK COUNTY

C. G. Uhley	Crookston

POPE COUNTY

Paul Swedenburg	Glenwood
G. E. Lee	Glenwood

RAMSEY COUNTY

D. M. Craig	St. Paul
M. L. Straus	St. Paul
A. E. Muller	No. St. Paul

RED LAKE COUNTY

Lester Dale	Red Lake Falls

REDWOOD COUNTY

A. W. Diessner	Redwood Falls
W. E. Johnson	Morgan
H. Knoche	Morgan

RENVILLE COUNTY

J. A. Cosgriff, Sr.	Olivia
John Dordal	Sacred Heart
R. Pierce	Olivia

RICE COUNTY

A. W. Nuetzman	Faribault
Bernard Street	Northfield
Paul G. Bauer	Faribault

ROCK COUNTY

C. L. Sherman	Luverne
A. C. Martin	Luverne
F. W. Bofenkamp	Luverne

ROSEAU COUNTY

Lloyd Klefstad	Greenbush

ST. LOUIS COUNTY

J. J. Coll	Duluth
K. E. Johnson	Duluth
A. L. Abraham	Duluth

SCOTT COUNTY

H. M. Juergens	Belle Plaine
Harry N. Simmonds	Prior Lake
J. E. Ponterio	Shakopee

SHERBURNE COUNTY

A. B. Roehlke	Elk River

SIBLEY COUNTY

Rolf Hovde	Winthrop
R. H. Kath	Arlington
D. C. Olson	Gaylord

STEARNS-BENTON COUNTY

C. F. Brigham, Jr.	St. Clou
J. B. Beuning	St. Clou
R. N. Jones	St. Clou
N. F. Musachio	Fol
K. A. Walfred	St. Clou

STEELE COUNTY

A. J. Olson	Owaton
J. A. McIntyre	Owaton

STEVENS COUNTY

O. A. Eide	Hanco
R. A. Rossberg	Mor
A. I. Arneson	Mor

SWIFT COUNTY

E. J. Kaufman	Applet
R. P. Griffin	Bens
Donald Holm	Bens

TODD COUNTY

M. E. Mosby	Long Prai
J. M. Cook	Stap
F. N. Grose	Claris

TRAVERSE COUNTY

A. L. Lindberg	Wheat
A. E. Magnuson	Wheat
W. F. Muir	Browns Vall

WABASHA COUNTY

C. G. Ochsner	Wabas
E. C. Bayley	Lake C
E. W. Ellis	El

WADENA COUNTY

L. T. Davis	Wade
C. H. Pierce	Wade
W. E. Parker	Seb

WASECA COUNTY

S. T. Normann	Was
B. J. Gallagher	Was

WASHINGTON COUNTY

M. Juergens	Stillwa
C. H. Sherman	Bayp
R. E. Carlson	Stillwa

WATONWAN COUNTY

A. D. Mattson	Saint Ja
Herbert Boysen	Mad

WILKIN COUNTY

L. O'Brien	Breckenri
C. W. Jacobson	Breckenri

WINONA COUNTY

Herbert vR. Heise	Win
Robert B. Tweedy	Win
Henry J. Roemer	Win

WRIGHT COUNTY

S. J. Raetz	Maple L
R. M. Sandeen	Buf

YELLOW MEDICINE COUNTY

Carl Lundell	Granite F
O. M. Odland	Granite F
E. R. Hudec	E

WOMAN'S AUXILIARY to the MINNESOTA STATE MEDICAL ASSOCIATION

Officers

s. H. H. Fesler	*President*	St. Paul
s. L. P. Howell	*President-elect*	Rochester
s David Halpern	*First Vice President*	Brewster
s. Karl Johnson	*Second Vice President*	Duluth
s. Harvey O. Beek	*Third Vice President*	St. Paul
s. A. O. Swenson	*Fourth Vice President*	Duluth
s. E. R. Hudec	*Recording Secretary*	Echo
s. W. P. Gardner	*Corresponding Secretary*	St. Paul
rs. W. B. Stromme	*Treasurer*	Minneapolis
s. G. H. Goehrs	*Auditor*	St. Cloud
rs. Wm. H. Von Der Weyer	*Historian*	St. Paul
s. Leo Fink	*Parliamentarian*	Minneapolis

Regional Advisors

rs. W. E. Wellman	*First District*	Rochester
rs. O. M. Heiberg	*Second District*	Worthington
s. Magnus Westby	*Third District*	Madison
rs. C. J. Fritsche	*Fourth District*	New Ulm
rs. O. I. Sohlberg	*Fifth District*	St. Paul
rs. Conrad Karleen	*Sixth District*	Minneapolis
rs. Leslie M. Evans	*Seventh District*	Sauk Rapids
rs. Vernon D. Thysell	*Eighth District*	Hawley
rs. J. L. McLeod	*Ninth District*	Grand Rapids

Chairmen of Committees

anding Committees

ied Medical Careers—
Mrs. M. I. Hauge.....Clarkfield

M.E.F.—Mrs. John Dordal.....Sacred Heart

chives—Mrs. James L. Benepe.....St. Paul

lletin—Mrs. C. E. Carlson.....Alexandria

ncer—Mrs. J. H. Cameron.....Crookston

itor (Minnesota Medicine)—
Mrs. L. J. Leonard.....Minneapolis

ance—Mrs. Mark Ryan.....St. Paul

gislation—Mrs. Philip K. Arzt.....St. Paul

dical and Surgical Relief—
Mrs. W. T. Greenfield.....Cokato

ganization—Mrs. L. P. Howell.....Rochester

ess and Publicity—Mrs. G. E. Harmon.....St. Paul

Printing and Roster—
Mrs. Reuben Erickson.....Minneapolis

Program and Health Education—
Mrs. Charles E. Merkert.....Minneapolis

Public Relations—Mrs. G. A. Hedberg.....Nopeming

Resolutions—Mrs. A. E. Lindblom.....Mankato

Revisions—Mrs. Harold F. Wahlquist.....Minneapolis

Special Committees

Civil Defense—Mrs. Donald H. Dewey.....Owatonna

Health Days—Mrs. Peter S. Rudie.....Duluth

In Memoriam—Mrs. Herman Kesting.....St. Paul

Mental Health—Mrs. William Gjerde.....Lake City

Newsletter—Mrs. M. F. Fellows.....Duluth

County Society Roster

Key to Symbols:
*Deceased, †Affiliate, Associate, Junior Associate, Life or Resident Member; ‡In Service;
§Wife is Member of Woman's Auxiliary.

BLUE EARTH COUNTY MEDICAL SOCIETY

Blue Earth County

Regular Meetings, last Monday of the month. Annual Meeting, last Monday of December.

Number of Members—62

President
CHALGREN, WILLIAM S.......Mankato
Secretary
MCNEAR, GEORGE R., JR.......Mankato

§ Anderson, James J.......Mankato
Anderson, Margaret C.......Mankato
†§Andrews, Roy N.......Mankato
§ Baird, Raymond L.......Lake Crystal
§ Batdorf, B. Niles.......Mankato
§ Butzer, John A.......Mankato
§ Butzer, John F.......Mankato
§ Chalgren, William S.......Mankato
§ Conley, Robert H.......Mankato
Dobson, M. W.......Mankato
§ Engstrom, Robert.......Mankato
§ Eustermann, John J.......Mankato
Fortier, Rene G.......Mankato
†§Franchere, Fredk. Wm.......Lake Crystal
†§Fugina, George R.......Mankato
§ Geurs, Benjamin R.......Mankato
§ Haes, Julius E.......Mankato
§ Hammar, Lawrence M.......Mankato
Hankerson, Robert G.......Minnesota Lake
† Hassett, Roger C.......Mankato
Heimark, John J.......Mankato
§ Heller, Edgar E.......Mankato
§ Hoeper, Philip G.......Mankato
§ Howard, Marshall I.......Mankato
† Huffington, Herbert L., Sr.......Lutsen
§ Huffington, Herb. L.......Waterville
§ Jones, Orville H.......Mankato
† Juliar, Richard O.......Los Angeles, Calif.
§ Kaufman, Walter B.......Mankato
§ Kearney, Rochfort W.......Mankato
§ Kemp, Alphonse F.......Mankato
§ Koenigsberger, Charles.......Mankato
§ Langboff, Arthur H.......Mankato
† Liedloff, Adolph G.......Mankato
§ Lindholm, Alton E.......Mankato
† Luck, Hilda.......Mankato
§ McNear, George R., Jr.......Mankato
†§Mickelson, John C.......Durham, N. C.
†§Miller, Victor I.......Mankato
§ Morgan, Hugh O.......Amboy
Olive, John T.......Mank
§ Penn, George E.......Mank
§ Roth, Frederick D.......Mank
§ Sanford, Raymond A.......Mank
Scheidel, Alois M.......Mank
† Schmidt, Paul A.......Aurora, Illi
§ Schmitz, Anthony A.......Mank
§ Sjoding, J. Donald.......Mank
§ Smith, Harry J.......Lake Cr
§ Smith, Paul M.......Lake Cr
Snider, Howard R.......Man
† Sohmer, Alphonse E.......Man
§ Stillwell, Walter C.......Man
Swenson, Donald B.......Mank
§ Thiem, Chester E.......Man
§ Troost, Henry B.......Man
§ Vezina, John C.......Maple
§‡Von Drasek, Joseph.......Man
†§ Wentworth, Albert J.......Man
† Williams, Hugh O.......Lake Cr
§ Wohlrabe, John C.......St. (
Zee, Urban H.......Man.

BLUE EARTH VALLEY MEDICAL SOCIETY

Martin-Watonwan-Faribault

Regular Meetings, third Thursday of each month. Annual Meeting in November.

Number of Members—50

President
WANDKE, OTTO E.......Fairmont
Secretary
BOYSEN, HERBERT.......Madelia

Anderson, John W.......Blue Earth
§ Armstrong, Ralph S.......Winnebago
Barr, James S.......Elmore
§ Bergman, Oscar B.......St. James
§ Blumberg, Henry B.......Fairmont
§ Boysen, Herbert.......Madelia
§ Bratrude, Earl J.......St. James
§†Chambers, Winslow C.......Blue Earth
† Cooper, Maurice D.......Winnebago
§ Coulter, Harold E.......Madelia
§ Drexler, George W.......Blue Earth
§ Gamble, Elbert J.......Bricelyn
Gamm, Edgar R.......Triumph
Gardner, Jack K.......Ceylon
§ Gardner, Victor H.......Fairmont
Halverson, Donald E.......Winnebago
§ Hanson, Lewis.......Frost
§ Heimark, Julius J.......Fairmont
§ Hruza William J.......Madelia
§†Hunt, Roscoe C.......Fairmont
Kraemer, George N.......Fairmont
§ Krause, C. W.......Fairmont
§ Lester, Malcolm J., Jr.......Truman
§ Lindahl, Merlyn J.......Sherburn
Louisell, Charles T.......Fairmont
† McGroarty, John J.......Easton
Mattson, Albert D.......St. James
Mills, John L.......Winnebago
† Misbach, William D.......Sherman Oaks, Calif.
‡ Moulton, K. B.......St. James
§ Nickerson, John R.......Fairmont
§ Nickerson, Neil D.......Fairr
§ Ourada, Anthony L.......Fairr
§ Parsons, R. A.......St. J.
Parsons, Ralph L.......Mont
† Rollins, Troy G.......Roch
§ Rovelstad, Roger A.......Fairr
§ Russ, Homer H.......Blue E
§ Smith, Don V.......Blue E
§ Snyder, Clifford D.......Ki
§ Thayer, Ellsworth A.......Fairr
Thompson, A. Henry.......Ma
§ Vaughan, Victor M.......Tru
§ Virnig, Mark P.......
§ Virnig, Richard P.......
§ Wandke, Otto E.......Fair
§ Watkins, John A.......
§ Williamson, Harold A.......Fair
† Wilson, Clyde E.......Blue
§ Zemke, Erhart E.......Fair

BROWN COUNTY MEDICAL SOCIETY

Brown County

Regular Meetings, quarterly. Annual Meeting in January.

Number of Members—30

President
FRITSCHE, CARL J.......New Ulm
Secretary
KAISER, MILTON.......New Ulm

§ Black, William A.......New Ulm
§ Burnett, Joseph W.......New Ulm
§ Cairns, Robert J.......Redwood Falls
§ Carthey, Frank J.......New Ulm
§ Dubbe, Frederick H.......New Ulm
§ Dysterheft, Adolf E.......Gaylord
§ Fesenmaier, Otto B.......New Ulm
Flinn, James B.......Redwood Falls
§ Fritsche, Albert.......New Ulm
§ Fritsche, Carl J.......New Ulm
§ Fritsche, Theodore R.......New Ulm
Goblirsch, Andrew P.......Sleepy Eye
Hovde, Rolf.......Winthrop
Inglis, William.......Redwood Falls
§ Kaiser, Milton L.......New Ulm
§ Keithahn, Elmer E.......Sleepy Eye
§ Kitzberger, Peter J.......New Ulm
§ Kruzick, S. J.......Sleepy Eye
†§Kusske, Arthur L.......New
§ Muesing, William J.......New
Nuessle, Walter G.......Sprin
§ Penk, Engward L.......Sprin
Peterson, Roy A.......
†§ Reineke, George F.......New
§ Saffert, Cornelius A.......New
§ Schroeppel, John E.......Win
§ Seifert, Otto J.......New
§ Vogel, Howard A. L.......New
Wisness, Osmund A.......Co
§ Wohlrabe, Edwin J.......Sprin

CAMP RELEASE DISTRICT MEDICAL SOCIETY

Chippewa, Lac qui Parle and Yellow Medicine Counties

Regular Meetings, second Thursday. Annual Meeting in November.

Number of Members—34

President
ODLAND, OLIN M. .... Granite Falls
Secretary
ALLEN, JOHN H. .... Montevideo

Allen, John H. .... Montevideo
Anderson, Chester A. .... Madison
Barr, Ronald W. .... Montevideo
Boody, George, Jr. .... Sandstone
Burns, Floyd M. .... Milan
Burns, M. Alpheus .... Milan
Camp, Ray Junior .... Madison
Fallon, Virgil .... Dawson
‡ Flom, Robert S. .... Columbus, Ga.
Guilbert, G. D. .... Minneapolis
Hartfiel, Herbert A. .... Montevideo
§ Hauge, Malvin I. .... Clarkfield
† Holmberg, LeRoy J. .... Canby
§ Hudec, Elwyn R. .... Echo
Hustad, Edward G. .... Montevideo
§ Johnson, Vilhelm M. .... Dawson
† Jordan, Kathleen B. Smith .... Granite Falls
Jordan, Lewis S. .... Granite Falls
§ Kaufman, William C. .... Appleton
†§Krystosek, Lee A. .... Madison, Wis.
Larson, Arthur N. .... Madison
Larson, Dorette W. .... Madison
*†Lee, Walter N. .... Claremont, Calif.
§ Lima, Ludvig R., Jr. .... Montevideo
§ Lundell, Carl L. .... Granite Falls
‡ Maus, Phillip .... New Orleans, La.
§ Miller, William P. .... Montevideo
Nelson, Melvin S. .... Granite Falls
§ Odland, Olin M. .... Granite Falls
§ Owens, William A. .... Montevideo
Pertl, Albert L. .... Canby
§ Roust, Henry A. .... Montevideo
§ Schmidt, Paul G., Jr. .... Granite Falls
§ Westby, Magnus .... Madison
§ Wesbty, Norval M. .... Madison

CLAY-BECKER COUNTY MEDICAL SOCIETY

Clay & Becker Counties

Regular Meetings, spring, fall and winter. Annual Meeting, November 30.

Number of Members—24

President
RICE, HAGBART G. .... Moorhead
Secretary
DODDS, WILLIAM C. .... Detroit Lakes

Bigler, Earl E. .... Perham
Bigler, Ivan E. .... Perham
Bottolfson, Bottolf T. .... Moorhead
Carlson, Vernon J. .... Moorhead
§ Dodds, William C. .... Detroit Lakes
§ Duncan, James W. .... Moorhead
§ Geib, Marvin J. .... Moorhead
† Hagen, Olaf J. .... Moorhead
§ Houglum, Arvid J. .... Lake Park
§ Humphrey, Edward W., Sr. .... Moorhead
Johnson, Olga H. .... Moorhead
§ Larson, Arnold .... Detroit Lakes
§ Lorentzen, Ernest S. .... Detroit Lakes
§ Midthune, A. S. .... Lake Park
§ Moberg, Clarence W. .... Detroit Lakes
§ Odland, Mark E. .... Detroit Lakes
§ Rice, Hagbart G. .... Moorhead
§ Rutledge, John B. .... Detroit Lakes
§ Rutledge, Lloyd H. .... Detroit Lakes
Saxman, Gertrude .... Georgetown
§ Simison, Carl .... Barnesville
† Thysell, Fred A. .... Moorhead
§ Thysell, Vernon D. .... Hawley
§ Watson, Virgil A. .... Detroit Lakes

EAST CENTRAL MINNESOTA MEDICAL SOCIETY

Anoka, Chisago, Isanti, Kanabec, Mille Lacs, Pine and Sherburne Counties

Regular Meetings, first Tuesday of every other month of the year.
Annual Meeting, first Tuesday in December.

Number of Members—40

President
BURSETH, EDGAR C. .... Mora
Secretary
TESCH, GORDON H. .... Elk River

Adkins, Galen H. .... Anoka
Albrecht, H. H. .... Chisago City
Berge, Harry L. .... Mora
Beyer, Eugene F. .... San Francisco, Calif.
Bossert, Clarence S. .... Mora
Bunker, Bevan W. .... Anoka
Burseth, Edgar C. .... Mora
Dredge, Homer P. .... Sandstone
Gully, Raymond J. .... Cambridge
Halpin, Joseph E. .... Rush City
§ Hedenstrom, Paul H. .... Cambridge
Henry, Harold W. .... Hinckley
Holmes, Alva E. .... Rush City
§ Hubin, Edwin G. .... Sandstone
Johnson, Aldridge F. .... Isle
Johnson, Robert H. .... Chisago City
§ Kapsner, Alfred T. .... Princeton
† Kelsey, Carleton G. .... St. Paul
Lee, Henry M. .... Cambridge
§ McManus, William F. .... Princeton
Mach, Ralph F. .... Pine City
Magnuson, Raymond C. .... Cambridge
Metcalf, Norman B. .... Princeton
Nelson, Luther A. .... Rush City
§ Nordman, Willard F. .... Mora
Nygren, William T. .... Braham
† Pasek, Edward A. .... Minneapolis
Peterson, Alvin C. .... Mora
Pone, John .... Cambridge
* Potek, David .... Cambridge
§ Roehlke, Arthur B. .... Elk River
Rudolph, Frank A. .... Sandstone
Schut, John W. .... Anoka
Spurzem, Raymond J. .... Anoka
‡ Stahn, Louis H. .... Modesto, Calif.
§ Stratte, Alf K. .... Pine City
§ Swensen, Roy G. .... North Branch
§ Tesch, Gordon H. .... Elk River
Vik, Melvin .... Anoka
† Waller, Joseph D. .... Pine City
Woyda, William C. .... Elk River

FREEBORN COUNTY MEDICAL SOCIETY

Freeborn County

Regular Meetings, third Thursday of even months. Annual Meeting, December.

Number of Members—32

President
SCHMIDT, RUBEN F. .... Alden
Secretary
ELLERTSON, LEONARD M. .... Albert Lea

Barr, Lowell C. .... Albert Lea
Burns, Catherine .... Albert Lea
Butturff, Carl R. .... Freeborn
§Calhoun, F. W. .... Albert Lea
Demo, Robert A. .... Albert Lea
Donovan, Daniel L .... Albert Lea
Egge, Sanford G .... Albert Lea
§ Ellertson, Leonard M. .... Albert Lea
§ Erdal, Ove A. .... Albert Lea
§ Folken, Frank G. .... Albert Lea
† Freeman, John P. .... Glenville
Gill, Theodore .... Albert Lea
† Gillickson, Andrew .... Minneapolis
§ Hansen, Theodore M. .... Albert Lea
§ Holian, Darwin K. .... Albert Lea
† Kaasa, Lawrence J. .... Albert Lea
§ Keil, Marcus A. .... Albert Lea
† Leopard, Brand A. .... Brownsville, Texas
Menefee, Edward C. .... Albert Lea
§ Neel, Harry B. .... Albert Lea
§ Nelson, Clayton E .... Albert Lea
§ Nesheim, Martin O .... Emmons
§ Palmer, Clinton F. .... Albert Lea
§ Person, John P. .... Albert Lea
§ Prins, Leo R. .... Albert Lea
Ryding, Vincent .... Albert Lea
§ Schmidt, Ruben F. .... Alden
†§Schultz, J. Albert .... Albert Lea
§ Sherman, Alfred G. .... Albert Lea
‡§Steiner, Leon E. .... Philadelphia, Pa
§ Whitson, Sidney A .... Albert Lea
§ Wilcox, G. Charles .... Albert Lea

GOODHUE COUNTY MEDICAL SOCIETY

Goodhue County

Regular Meetings, second Thursday. Annual Meeting, December.

Number of Members—27

President
DEGEEST, JAMES H. .... Goodhue
Secretary
HAWLEY, GEORGE M. B. .... Red Wing

† Aanes, Almer M. .... Red Wing
§ Akins, Willard M. .... Red Wing
§ Allen, George S. .... Cannon Falls
‡ Boswell, J. Thornton .... Kenosha, Wis.
§ Bridge, Ezra V. .... Cannon Falls
§ Brusegard, James F. .... Red Wing
Claydon, Howard F. .... Red Wing
§ deGeest, James H. .... Goodhue

‡ Dovenmuehle, Robert H.	Durham, N. C.
§ Falls, John L.	Red Wing
§ Graves, Richard B.	Red Wing
§ Halvorson, James W.	Zumbrota
§ Hartnagel, G. F.	Red Wing
§ Hawley, George M. B.	Red Wing
*§Hedin, Raymond F.	Red Wing
† Jones, Alvah W.	Red Wing
§ Juers, Edward H.	Red Wing
§ Kimmel, George C.	Red Wing
Larson, Oliver E. H.	Zumbrota
§ Liffrig, William W.	Red Wing
§ Miller, Winston R.	Red Wing
§ Molenaar, Robert E.	Cannon Falls
§ Sherman, Royal V.	Red Wing
† Smith, Myron W.	Red Wing
§ Steffens, Leon A.	Red Wing
§ Walter, William E.	Wanamingo
§ Wasmund, Clarence W.	Red Wing
§ Williams, Marland R.	Cannon Falls

HENNEPIN COUNTY MEDICAL SOCIETY

Hennepin County
Regular Meetings, first Monday of each month, October through May.
Annual Meeting, first Monday in October.
Number of Members—965

President	
PRIEST, ROBERT E.	Minneapolis
Secretary	
HOLMBERG, CONRAD J.	Minneapolis
Exec. Secretary	
COOK, THOMAS P.	Minneapolis

Abramson, Milton	Minneapolis
Adkins, Charles D.	Minneapolis
‡ Agustsson, Hreidar	Aberdeen, Md.
§ Ahern, Eugene E.	Minneapolis
§ Alexander, Harlan A.	Minneapolis
§ Aling, Charles A.	Minneapolis
Althausen, Theodore L., Jr.	Minneapolis
† Altnow, Hugo O.	Coral Gables, Fla.
§ Amatuzio, Donald S.	Minneapolis
§ Andersen, Silas C.	Minneapolis
§ Anderson, Arnold S.	St. Louis Park
§ Anderson, David M.	Minneapolis
† Anderson, Edward D.	Minneapolis
§ Anderson, Ernest R.	Minneapolis
§ Anderson, Frank J.	Minneapolis
§ Anderson, John T.	Minneapolis
§ Anderson, Karl W.	Minneapolis
§ Anderson, Roger L.	Minneapolis
§ Anderson, U. Schuyler	Minneapolis
Anderson, Wallace E.	Minneapolis
§ Anderson, William H.	Minneapolis
Anderson, William T.	Minneapolis
Andreassen, Einar C.	St. Paul
§ Andreassen, Rolf L.	Minneapolis
§ Andresen, Karl d'A.	Minneapolis
§ Andrews, Robert S.	Minneapolis
§ Ankner, Frank J.	Minneapolis
Arends, Archabald L.	Minneapolis
§ Arey, Stuart Lane	Minneapolis
§ Arhelger, Stuart W.	Minneapolis
§ Arlander, Clarence E.	Minneapolis
§ Arling, Leonard S.	Minneapolis
§ Arms, James J.	Minneapolis
Arnold, Anna W.	Minneapolis
Arvidson, Carl G.	Minneapolis
†§Aune, Martin	Minneapolis
* Aurand, William Henry	Minneapolis

§ Baggenstoss, Osmond J.	Minneapolis
Bagley, Russell W.	Minneapolis
§ Baird, Joseph W.	Minneapolis
§ Baken, Melvin P.	Minneapolis
Baker, Abe B.	Minneapolis
Baker, Alfred T.	Minneapolis
§ Baker, Milton E.	Minneapolis
§ Baleisis, Peter	Minneapolis
§ Balkin, Samuel G.	Minneapolis
§ Balogh, Charles J.	Minneapolis
Bank, Harry E.	San Francisco, Calif.
§ Barno, Alex	St. Louis Park
§ Barr, Maxwell M.	Minneapolis
Barr, Robert N.	Minneapolis
Barron, Jesse J.	Minneapolis
†§Barron, Moses	Minneapolis
‡ Barron, S. Steven	Minneapolis
*†§Baxter, Stephen H.	Minneapolis
§ Beach, Northrop	Minneapolis
† Becker, Arnetta	Minneapolis
§ Bedford, Edgar W.	Minneapolis
§ Beirstein, Samuel	Minneapolis
§ Beiswanger, Richard H.	Minneapolis
† Bell, E. T.	Minneapolis
§ Belleville, Titus P.	Minneapolis
§ Belzer, Meyer S.	Minneapolis
Benesh, Louis A.	Minneapolis
§ Benjamin, Edwin G.	Minneapolis
§ Benjamin, Harold G.	Minneapolis
Berg, Clinton C.	Wayzata
Berger, Alex G.	Minneapolis
§ Bergh, George S.	Minneapolis
Bergh, Solveig M.	Minneapolis
§ Berglund, Eldon B.	Minneapolis
§ Bergquist, James R.	Minneapolis
§ Berkwitz, Nathaniel J.	Minneapolis
Berman, Reuben	Minneapolis
Bernstein, Irving C.	Minneapolis
§ Bessesen, Alfred N., Jr.	Minneapolis
Bieter, Raymond N.	Minneapolis
§ Bilka, Paul J.	Minneapolis
§ Binder, Manuel R.	Minneapolis
§ Blake, Allen J.	Hopkins
§ Blake, James A.	Hopkins
§ Blake, Paul S.	Hopkins
§ Bloedel, Traugott J.	Osseo
§ Blomberg, Robert D.	Minneapolis
Blomberg, William R.	Minneapolis
§ Bloom, Norman B.	Minneapolis
§ Blumenthal, Jacob S.	Minneapolis
§ Boehrer, John J.	Minneapolis
§ Bofenkamp, Benjamin	Minneapolis
§ Bohn, Donald G.	Minneapolis
§ Boies, Lawrence R.	Minneapolis
† Booth, Albert E.	Minneapolis
† Boreen, Clifton A.	Minneanolis
†§Borgeson, Egbert J.	St. Paul
§ Borman, Chauncey N.	Minneapolis
§ Borowicz, Leonard A.	Minneapolis
§ Bowers, Gordon G.	Minneapolis
Boynton, Ruth E.	Minneapolis
Braasch, John W.	Minneapolis
§ Bratrud, Arthur F.	Minneapolis
Bratrud, Theodore E.	Minneapolis
Breitenbucher, Robert B.	Minneapolis
§ Brekke, Harvey J.	Minneapolis
§ Bridge, Allyn G.	Minneapolis
Brill, Alice K.	Minneapolis
† Brooks, Charles N.	Minneapolis
† Brown, Edgar D.	St. Petersburg, Fla.
§ Brown, Ian A.	Minneapolis
Brown, William D.	Minneapolis
§ Buchstein, Harold F.	Minneapolis
§ Buirge, Raymond E.	Minneapolis
Bulkley, Kenneth	Minneapolis
§ Burnham, Wesley H.	Minneapolis
§ Bushard, Wilfred J.	Minneapolis
§ Buzzelle, Leonard K.	Minneapolis

§ Cable, Morris L.	Minneapolis
§ Cabot, Clyde M.	Minneapolis
Cady, Laurence H.	Minneapolis
Cameron, Isabell L.	Minneapolis
Campbell, Lowell M.	Minneapolis
§ Campbell, Orwood J.	Minneapolis
§ Caplan, Leslie	Minneapolis
§ Card, William H.	Minneapolis
Carey, James B.	Minneapolis
§ Carlander, Lester W.	Minneapolis
Carlson, Charles V.	Mound
§ Carlson, Lawrence	Minneapolis
§ Carlson, Leonard T.	Minneapolis
§ Caron, Robert P.	Minneapolis
§ Carr, William J.	Minneapolis
§ Caspers, Carl G.	Minneapolis
†§Cavanor, Frank T.	Minneapolis
§ Ceder, Elmer T.	Minneapolis
Challman, S. Alan	Minneapolis
§ Chavez, Demetrio A.	Minneapolis
§ Chesler, Merrill D.	Minneapolis
*†Chesley, Albert J.	Minneapolis
§ Child, Sherman B.	Minneapolis
§ Chisholm, Tague C.	Minneapolis
Clark, Malcolm D.	Minneapolis
§ Clay, Lyman B.	Minneapolis
§ Cochrane, Ray F.	Minneapolis
Coe, John I.	Minneapolis
§ Cohen, Bernard A.	Minneapolis
Cohen, Ephraim B.	Minneapolis
Cohen, Maynard M.	St. Paul
§ Cohen, Sumner S.	Oak Terrace
Cole, James S.	Minneapolis
* Condit, William H.	Minneapolis
§ Cooper, Robert R.	Minneapolis
Corniea, Albert D.	Minneapolis
‡§Correa, Dale H.	Minneapolis
§ Corrigan, Cyril J.	Minneapolis
Cowan, Donald W.	Minneapolis
Craig, M. Elizabeth	Minneapolis
§ Cranmer, Richard R.	Minneapolis
Cranston, Robert W.	Minneapolis
§ Creevy, Charles D.	Minneapolis
*§Creighton, Ralph H.	Minneapolis
§ Culligan, Leo C.	Minneapolis
§ Cundy, Donald T.	Minneapolis
† Cutts, George	Minneapolis

Dady, Elmer E.	Minneapolis
§ Daggett, Donald R.	Minneapolis
§ Dahl, Elmer O.	Minneapolis
Dahl, James C.	Minneapolis
§ Dahl, John A.	Minneapolis
†§Daniel, Donald H.	Minneapolis
‡§Danyluk, Michael	Minneapolis
§ David, Reuben	Minneapolis
§ Davis, Jay C.	Minneapolis
§ Davis, William I.	Mound
§ del Plaine, Carlos W.	Minneapolis
§ Devereaux, Thomas J.	Wayzata
‡ Dickman, Roy W.	Monterey, Calif
§ Diefenbach, Eugene J., Jr.	Minneapolis
§ Diehl, Harold S.	Minneapolis
§ Dierker, Heinrich	Minneapolis
Diessner, Henry D.	Minneapolis
§ Donatelle, Edward P.	Minneapolis
§ Dorge, Richard I.	Minneapolis
† Dornblaser, Harry B.	Los Gatos, Calif.
§ Dorsey, George C.	Minneapolis
† Doxey, Gilbert L.	Minneapolis
§ Doyle, Lawrence O.	Minneapolis
†§Drake, Charles R.	Minneapolis
§ Drill, Herman E.	Hopkins
§ Duff, Edwin R.	Minneapolis
Dummer, Donald J.	Minneapolis
§ Dunlap, Earl H.	Minneapolis
§ Dupont, Joseph A.	Excelsior
§ Duryea, Marbry	Minneapolis
§ Duryea, Willis M.	Minneapolis
Duryea, Willis M., Jr.	Minneapolis
*†Dutton, C. E.	Minneapolis
§ Dvorak, Benjamin A.	Minneapolis
§ Dwan, Paul F.	Minneapolis
§ Dworsky, Samuel D.	Minneapolis

§ Eder, W. P.	Minneapolis
§ Ehrenberg, Claude J.	Minneapolis
§ Ehrlich, S. Paul	Minneapolis
§ Eich, Matthew A.	Minneapolis
§ Eichhorn, Edmund P.	Minneapolis
Eisenstadt, David H.	Minneapolis
§ Eisenstadt, William S.	Minneapolis
§ Eitel, George D.	Minneapolis
§ Eli, Earl W.	Minneapolis
§ Ellison, David E.	Minneapolis
§ Ellison, Ellis	Minneapolis
Elrod, Calvin R.	Long Lake
§ Emond, Albert J.	Farmington
§ Emond, Joseph S.	Farmingto
§ Engel, Joseph P.	Minneapolis
§ Engelhart, Peter C.	Minneapoli
§ Englund, Elvin F.	Minneapoli
§ Engstrand, Oscar J.	Minneapoli
§ Engstrom, Denton P.	Minneapoli
§ Erickson, Clifford O.	Minneapoli
§ Erickson, Laurence F.	Minneapoli
§ Erickson, Myron E.	Minneapol
§ Erickson, Reuben F.	Minneapol
*§Ericson, Reinhold M.	Wayzat
§ Esensten, Sidney	Minneapol
§ Evans, Edward T.	Minneapol
Evans, Robert D.	Minneapol

† Fahr, George	Minneapol
§ Fansler, Walter A.	Minneapol
§ Feeney, John M.	Minneapol
§ Feigal, David W.	Wayza
Feinberg, Philip	Minneapo
Feinberg, Samuel B.	Minneapo
§ Feinstein, Julius Y.	Minneapol
§ Fenger, Ejvind P. K.	Oak Terrac
§ Field, Charles W.	Minneapol
§ Fingerman, David L.	Minneapo
§ Fink, Leo Wm.	Minneapol
§ Fink, Walter H.	Minneapol
§ Fisher, Isadore I.	Minneapo
† Fitzgerald, D. F.	Wayzat
†§Fjelstad, Christian A.	Minneapol
§ Fleeson, William H.	Minneapol
Fleming, Dean S.	Minneapol

Fliehr, Richard R	Minneapolis
Flink, Edmund B	Minneapolis
Foker, Leslie W	Minneapolis
Folsom, Louis B	Minneapolis
Ford, William H	Minneapolis
Foster, Orley W	Minneapolis
Fowler, Lucius Haynes	Minneapolis
Fox, Donald P	Tanganyika, East Africa
Fox, James Rogers	Minneapolis
Frane, Donald B	Minneapolis
Fredericks, George M	Minneapolis
Freeman, Craig W	Minneapolis
Freeman, Donald W	St. Louis Park
French, Lyle A	Minneapolis
Frey, Richard J	Minneapolis
Friberg, Joseph B	Minneapolis
Fried, Louis A	Minneapolis
Friedell, Aaron	Minneapolis
Friedell, George	St. Louis Park
Friedman, Harry S	Minneapolis
Friedman, Jack	Minneapolis
Friend, Charles A	Minneapolis
Frost, John B	Minneapolis
Frost, Russell H	Oak Terrace
Frykman, Howard M	Minneapolis
Frys, Russell N	Minneapolis
Fuller, Alice H	Minneapolis
Funk, Victor K	Oak Terrace
Furman, Lucie Christine	Minneapolis
Gaard, Richard C	Minneapolis
Gallett, Lester E	Minneapolis
Galligan, Margaret M	Minneapolis
Gammell, John H	Minneapolis
Garamella, Joseph J	Minneapolis
Garske, George L	Minneapolis
Garten, Joseph L	Minneapolis
Garvey, James T	Minneapolis
Gaviser, David	Minneapolis
Gibbs, Robert W	Minneapolis
Giebenhain, John N	Minneapolis
Giere, Joseph C	Minneapolis
Giere, Richard W	Minneapolis
Gilbert, Maurice G	Minneapolis
Gingold, Benjamin A	Minneapolis
Girvin, Richard B	Minneapolis
Glaeser, John H	Minneapolis
Glueck, Bernard C	Minneapolis
Goetz, Frederick C	Minneapolis
Goldberg, Isadore M	Minneapolis
Goldman, Theodore I	Minneapolis
Goldner, Meyer Z	Minneapolis
Goltz, Robert W	Minneapolis
Good, Hoff D	Minneapolis
Goodchild, William R	Minneapolis
Gordon, Philip E	Minneapolis
Gordon, Sewell S	St. Louis Park
Grant, Suzanne	Minneapolis
§Gratzek, Frank R. E	Minneapolis
Gray, Royal C	Minneapolis
Green, Robert A	St. Louis Park
Greenberg, Albert J	Minneapolis
Greenfield, Irving	Minneapolis
Greishiemer, Esther M	Philadelphia, Pa.
Grimes, Marian	Minneapolis
Grimmell, Francis J	Minneapolis
Gronvall, Paul R	Minneapolis
Grotting, John K	Minneapolis
Gullickson, Glenn, Jr	Minneapolis
Gunlaugson, Frederick G	Minneapolis
Gushurst, Edward G	Minneapolis
Gustason, Harold T	Minneapolis
Haberer, Helen R	Minneapolis
Haberland, Lyle F	Minneapolis
Hagen, Kristofer	Richfield
Hagen, Wayne S	Minneapolis
Haggard, G. D	Minneapolis
Hall, Harry B	Minneapolis
Hall, Wendell H	Minneapolis
Hamel, Joseph I	Minneapolis
Hannah, Hewitt B	Minneapolis
Hansen, Cyrus O	Minneapolis
Hansen, Erling W	Minneapolis
Hansen, Olga S	Minneapolis
Hansen, Rollin M	Minneapolis
Hanson, Harlow J	Minneapolis
Hanson, Henry V	Minneapolis
Hanson, Malcolm B	Minneapolis
Hanson, Mark C. L	Minneapolis
Hanson, William A. H	Minneapolis
Happe, Lawrence J	Minneapolis
Harris, Leon D	Minneapolis
Hartman, Evelyn E	Minneapolis
Hass, Frederick M	Minneapolis
Hastings, DeForest R	Minneapolis
Hastings, Donald W	Minneapolis
Hauge, Erling T	Minneapolis
Haugen, George W	Minneapolis
Haugen, John A	Minneapolis
Hauser, Donald C	Minneapolis
Hauser, George W	Minneapolis
Havel, Robert J	Minneapolis
Haven, Walter K	Minneapolis
Hawkinson, Raymond P	Minneapolis
§ Hay, Lyle J	Minneapolis
† Hayes, James M	Minneapolis
§ Hays, Albert T	Minneapolis
§ Head, Douglas P	Minneapolis
§ Hebbel, Robert	Minneapolis
Hempel, Dean J	Minneapolis
† Hendrickson, John F	Minneapolis
§ Henrikson, Earl C	Minneapolis
† Henry, Clifford E	Kirksville, Mo.
Herbert, Willis L	Minneapolis
§ Hermann, Harold W	Minneapolis
†§Higgins, John H	Minneapolis
Hilgermann, George O	Minneapolis
Hill, Earl	Minneapolis
§ Hill, Elmer M	Minneapolis
†§Hillis, Samuel J	Minneapolis
Hinckley, Robert G	Minneapolis
§ Hirshfield, Frank R	Minneapolis
§ Hitchcock, Claude R	Minneapolis
Hoffbauer, Frederick W	Minneapolis
§ Hoffert, Henry E	Minneapolis
§ Hoffman, Roy A	Minneapolis
§ Hoffman, Walter L	Minneapolis
§ Holmberg, Conrad J	Minneapolis
Holzapfel, Fred C	Minneapolis
Horns, Howard L	Minneapolis
§ Horns, Richard C	Minneapolis
Houkom, Bjarne	Minneapolis
§ Houle, Rollin J	New Brighton
Hovland, Melvin L	Minneapolis
Howard, Robert B	Minneapolis
Howard, Solomon E	Minneapolis
§ Howell, Carter W	Minneapolis
Hudson, George E	Minneapolis
§ Huenekens, Edgar J	Minneapolis
Hulteng, Donald B	Minneapolis
§ Hultkrans, Rudolph E	Minneapolis
† Hurd, Annah	Minneapolis
Hutchinson, Dorothy W	Oak Terrace
§ Hymes, Charles	Minneapolis
† Hynes, John E	Minneapolis
Ide, Arthur W., Jr	Minneapolis
§ Idstrom, Linneus G	Minneapolis
Indeck, Walter	Minneapolis
§ Ingalls, Edgar G	Minneapolis
† Irvine, Harry G	Minneapolis
§ Iverson, Rolf M	Minneapolis
§ Jacobson, Loren J	Minneapolis
§ Jacobson, Wyman E	St. Louis Park
§ Jay, Alan R	Minneapolis
§ Jefferies, William L	St. Louis Park
§ Jensen, Harry C	Minneapolis
†§Jensen, Marius J	Minneapolis
§ Jensen, Nathan K	Minneapolis
Jensen, Reynold A	Minneapolis
Jerome, Bourne	Minneapolis
Jerome, Elizabeth	Minneapolis
Jeub, Robert P	Minneapolis
Johnson, Angelo	Minneapolis
§ Johnson, Arthur B	Minneapolis
§ Johnson, August E	Minneapolis
§ Johnson, Emil W	Minneapolis
Johnson, Frank E	Minneapolis
§ Johnson, Harry A	Minneapolis
†§Johnson, James A	Minneapolis
§ Johnson, John W	Minneapolis
†§Johnson, Julius	Minneapolis
§ Johnson, Malcolm R	Minneapolis
§ Johnson, Norman P	Minneapolis
§ Johnson, Norton T	Minneapolis
§ Johnson, Reinald G	Minneapolis
§ Johnson, Reuben A	Minneapolis
Johnson, Richard S	Minneapolis
§ Johnson, Robert E	Minneapolis
Johnson, Roger S	Wayzata
Johnson, Ronald G	Minneapolis
Johnson, Youbert T	Minneapolis
§ Jones, David G	Minneapolis
†§Jones, Herbert W., Jr	Minneapolis
§ Jones, Richard H	Minneapolis
§ Jones, William R	Minneapolis
Josewich, Alexander	Minneapolis
§ Judd, Allen S	Minneapolis
§ Judd, Walter H	Washington, D. C.
§ Jurdy, Mitchell J.	Minneapolis
§ Kadesky, Harold B	Minneapolis
§ Kalin, Oscar T	Minneapolis
§ Kallestad, Leonard L	Wayzata
Kantar, Bruce L	Minneapolis
§ Kaplan, Harold A	Minneapolis
§ Kaplan, John J	Minneapolis
§ Karleen, Conrad I	Minneapolis
§ Karlen, Markle	Minneapolis
Kaufman, Herschel J	Minneapolis
§ Kelby, Gjert M	Minneapolis
§ Kelly, Charles F	Minneapolis
§ Kelly, John P	Minneapolis
†§Kennedy, Claude C	Minneapolis
† Kennedy, Jane F	Minneapolis
§ Kerkhof, Arthur C	Minneapolis
Kiesler, Frank, Jr	Minneapolis
† King, Edgar A	Minneapolis
King, Frances W.	Oak Terrace
§ Kinsella, Thomas J	Minneapolis
§ Knapp, Miland E	Minneapolis
§ Knight, Ralph T	Minneapolis
† Knight, Ray R	Minneapolis
Knudsen, Helen L	Minneapolis
§ Koepcke, Gerald M	Minneapolis
Koller, Hermann M	Minneapolis
Koller, Louis R	Minneapolis
Koller, Robert L	Minneapolis
Korchik, John P	Minneapolis
Kosiak, John, Jr	Minneapolis
Kottke, Frederic J	Minneapolis
§ Koucky, Rudolph W	Minneapolis
§ Kovack, Freeman D	Minneapolis
§ Krafft, Walter E	Minneapolis
Kremen, Arnold J	Minneapolis
§ Krieser, Albert E	Minneapolis
§ Kucera, Frank J	Hopkins
§ Kucera, William J., Sr	Minneapolis
§ Kucera, William J., Jr	Minneapolis
§ Kusz, Clarence V	Minneapolis
§ LaBree, John W	Saint Louis Park
† Lajoie, John M	Minneapolis
§ Lamb, H. Douglas	Minneapolis
§ Lang, Leonard A	Minneapolis
‡ Lange, Robert D	Washington, D. C.
§ Lapierre, Arthur P	Minneapolis
Lapierre, Jean T	Minneapolis
§ Larsen, Frank W	Minneapolis
§ Larson, Clarence M	Minneapolis
§ Larson, Donald M	Minneapolis
§ Larson, Lawrence M	Minneapolis
§ Larson, Leonard M	Oak Terrace
§ Larson, Paul N	Minneapolis
Larson, Ralph H	Anoka
† LaVake, Rae T	Minneapolis
Laymon, Carl W	Minneapolis
*†Leavitt, H. H	Minneapolis
*†Lebowske, Joseph A	Minneapolis
§ Leemhuis, Andrew J	Minneapolis
§ Leiferman, Robert J	Minneapolis
§ Leland, Harold R	Minneapolis
§ Lenz, Otto A	Minneapolis
Leonard, Lawrence J	Minneapolis
§ Leonard, Samuel	Minneapolis
Lerner, A. Ross	Minneapolis
§ Lewis, F. John	Minneapolis
§ Lewis, Joyce S., Jr	Minneapolis
Lienke, Roger I	Minneapolis
Lillehei, C. Walton	Minneapolis
Lillehei, Elmer J	Robbinsdale
‡ Lind, Carl J., Jr	Washington, D. C.
Lindberg, Arthur N	Minneapolis
† Lindberg, Arvid C	Minneapolis
§ Lindberg, Vernon L	Minneapolis
§ Lindberg, Winston R	Minneapolis
Lindblom, Maurice L	Minneapolis
§ Lindemann, Charles E	Minneapolis
§ Lindgren, Russell C	Minneapolis
§ Lindner, Janus C	Minneapolis
§ Lindquist, Richard H	Minneapolis
§ Linner, Gunnar	Minneapolis
†§Linner, Henry P	Minneapolis
§ Linner, John H	Minneapolis
§ Linner, Paul W	Minneapolis
Lippman, Emanuel S	Minneapolis
§ Lipschultz, Oscar	Minneapolis
†§Litchfield, John T	Minneapolis
Litman, Abraham B	Minneapolis
Lober, Paul H	Minneapolis
§ Lofsness, Stanley V	St. Paul
†§Logefeil, Rudolph C	Minneapolis
† Loomis, Earl A	Minneapolis
§ Lott, Frederick H	Minneapolis
Lovett, Beatrice R	Oak Terrace
Lowry, Elizabeth C	Minneapolis
§ Lowry, Paul T	Minneapolis
Lowry, Thomas	Minneapolis
§ Lueck, Wallace W	Minneapolis
§ Lufkin, Nathaniel H	Minneapolis
Lund, George W	Minneapolis
Lundberg, Ruth I	Minneapolis
Lundblad, Roy A	Minneapolis
Lundblad, Stanley W	Minneapolis
§ Lundeberg, Karl R	Minneapolis
§ Lundquist, Virgil J. P	Minneapolis
† Lynch, Matthew J	Minneapolis
§ Lyons, James H	Minneapolis
Lyons, Michael W	Minneapolis
†§Lysne, Henry	Minneapolis
§ Lysne, Myron	Minneapolis
‡ Lysvj, Anatol	Minneapolis
Lyzenga, Anton G	Minneapolis
§ McCaffrey, F. John	Minneapolis
*§McCann, Eugene J	Minneapolis
§ McCannel, Malcolm A	Minneapolis
McCarthy, Donald	St. Paul
McCartney, James S	Minneapolis
§ McCormick, Donald P	Minneapolis
† McDaniel, Orianna	Minneapolis
§ McFarland, Arthur H	Minneapolis
§ McGandy, Robert F	Minneapolis

§ McGeary, George E.	Minneapolis
§ McInerny, Maurice W.	Minneapolis
McKelvey, John L.	Minneapolis
§ McKenzie, Charles H.	Minneapolis
§ McKinlay, Chauncey A.	Minneapolis
§ McKinney, Frank S.	Minneapolis
§ McLaughlin, Byron H.	Minneapolis
§ McMurtrie, William B.	Minneapolis
McNeil, John J.	Minneapolis
§ McPheeters, Herman O.	Minneapolis
† McQuarrie, Irvine	Minneapolis
§ MacDonald, Daniel A.	Minneapolis
§ MacDonald, John W.	Minneapolis
§ MacKinnon, Donald C.	Minneapolis
§ Mach, Frank B.	Minneapolis
§ Maeder, Edward C.	Minneapolis
†§Maland, Clarence O.	Minneapolis
Mandel, Sheldon L.	Minneapolis
§ Mankey, James C.	Minneapolis
§ Mann, George A.	Minneapolis
§ Marking, George H.	Minneapolis
Martin, Frank E.	Minneapolis
§ Martin, George R.	Minneapolis
Martinson, Carl J.	Wayzata
Martinson, Elmer J.	Wayzata
§ Mattill, Peter M.	Oak Terrace
§ Mattson, Hamlin A. N.	Minneapolis
Maunder, John B.	Minneapolis
§ Maxeiner, Stanley R.	Minneapolis
§ Maxeiner, S. R., Jr	Minneapolis
§ Meller, Robert L.	Minneapolis
§ Merkert, Charles E.	Minneapolis
§ Merkert, George L.	Minneapolis
† Merrick, Charlotte T.	St. Paul
§ Meyer, Alvin J.	Minneapolis
†§Meyer, Ette L.	Minneapolis
Meyer, Robert J.	Minneapolis
Michael, Joseph C.	Minneapolis
§ Michel, Henry H.	Minneapolis
§ Michelson, Henry E.	Minneapolis
† Mickelsen, Emma F.	Minneapolis
§ Miller, Arden L.	Minneapolis
§ Miller, Harold E.	Minneapolis
§ Miller, Hugo E.	Minneapolis
§ Miller, John C.	Minneapolis
§ Millett, D. Keith	Minneapolis
§ Milton, John S.	Minneapolis
Minsky, Armen A.	Minneapolis
§ Mitby, Irving	Minneapolis
§ Mitchell, Berton D.	Minneapolis
Mitchell, Edward C.	Minneapolis
§ Mitchell, Mancel T.	Minneapolis
§ Mixer, Harry W.	Minneapolis
§ Moberg, Thomas D.	Tacoma, Wash.
§ Moe, John H.	Minneapolis
§ Moehn, John T.	Minneapolis
§ Moen, Johannes K., Jr.	Minneapolis
† Monahan, Elizabeth S.	Minneapolis
§ Monson, Einer M.	Minneapolis
§ Moore, Irvin H.	Minneapolis
Moorhead, Marie	Minneapolis
§ Moos, Daniel J.	Minneapolis
§ Mork, A. Harold	Anoka
§ Mork, Frank E.	Anoka
Morrison, Charlotte J.	Minneapolis
§ Mosser, Donn G.	Minneapolis
§ Mover, Leonard B.	Minneapolis
§ Mulholland, William M.	Minneapolis
Murphy, Edmund P.	Minneapolis
Muske, Marvin M.	Minneapolis
§ Musty, Nicholas J.	Minneapolis
§ Myers, Jay A.	Minneapolis
§ Myhre, James A.	Minneapolis
§ Naslund, Ames W.	Minneapolis
§ Neal, Joe M.	St. Paul
§ Neary, Richard P.	Minneapolis
Nelson, Bernette G.	Minneapolis
Nelson, Bernice A.	Minneapolis
Nelson, C. Barton	Minneapolis
Nelson, Carleton A.	Minneapolis
§ Nelson, Edward N.	Minneapolis
§ Nelson, Harvey	Minneapolis
§ Nelson, Lloyd S.	Minneapolis
Nelson, Maxine O.	Minneapolis
§ Nelson, Maynard C.	Minneapolis
§ Nelson, O. L. Norman	Minneapolis
§ Nelson, Wallace I.	Minneapolis
§ Nerenberg, Samuel T	Minneapolis
Nesbitt, Samuel	Minneapolis
§ Nesset, Lawren B.	Minneapolis
§ Nesset, William D	Minneapolis
§ Neumeister, Charles A.	Minneapolis
§ Nice, Charles M.	Minneapolis
Noran, Axel S. N.	Minneapolis
§ Noran, Harold H	Minneapolis
§ Nord, Robert E.	Edina
§ Nordin, Gustaf T.	Minneapolis
§ Nordland, Martin, Sr.	Minneapolis
§ Nordland, Martin, Jr.	Minneapolis
*†Noth, Henry W.	Minneapolis
Nuessle, William F.	Minneapolis
§ Nydahl, Malvin J.	Minneapolis
§ Nylander, Emil G.	Minneapolis

O'Donnell, James E.	Minneapolis
§ O'Hanlon, John A.	Minneapolis
§ O'Phelan, E. Harvey	Minneapolis
† Oberg, Carl M.	Minneapolis
Olavs, Olga	Minneapolis
§ Olfelt, Paul C.	Minneapolis
§ Olsen, E. George	Minneapolis
§ Olson, Alton C.	Minneapolis
§ Olson, Carl J.	Minneapolis
Olson, C. Kent	Minneapolis
§ Olson, Detlof M.	Minneapolis
† Olson, Olof A.	Minneapolis
§ Olson, Philip A.	Minneapolis
Olson, Rolland A.	Wayzata
§ Oppen, E. Gerhard	Minneapolis
§ Oppen, Melvin G.	Wayzata
§ Opstad, Earl T.	Minneapolis
Paal, Dwain J.	Minneapolis
§ Palen, Benjamin J.	Minneapolis
Papermaster, Theodore C.	Minneapolis
Park, Wilford E.	Minneapolis
§ Pattee, James J.	Minneapolis
§ Peluso, Charles R.	Minneapolis
§ Peppard, Thomas A.	Minneapolis
§ Perlman, Everett C.	Minneapolis
§ Perlman, Herschel L.	Minneapolis
§ Peteler, Jennings C. L.	Minneapolis
§ Petersen, Deane A.	Minneapolis
§ Petersen, Glenn L.	Minneapolis
Petersen, Peter C.	Minneapolis
§ Petersen, William E.	Minneapolis
† Peterson, Alice H.	Minneapolis
Peterson, Henry	Minneapolis
§ Peterson, Herbert W.	Minneapolis
§ Peterson, Nordahl P.	Minneapolis
Peterson, Oliver H.	Minneapolis
§ Peterson, Palmer A.	Minneapolis
†§Peterson, Peter E.	Minneapolis
§ Peterson, Willard C.	Minneapolis
§ Petit, Julien V.	Minneapolis
§ Petit, Leon J.	Minneapolis
§ Pewters, John T.	Minneapolis
§ Peyton, William T.	Minneapolis
§ Phelps, Kenneth A.	Minneapolis
Plasha, Matthew K.	Anoka
§ Plass, Herbert F. R.	Minneapolis
†§Platou, Erling S.	Minneapolis
Pleissner, Karl W.	Minneapolis
§ Plimpton, Nathan C., Jr.	Minneapolis
Pohl, John F. M.	Minneapolis
§ Pollock, Anthony J.	Minneapolis
†§Pollock, David K.	Minneapolis
§ Polzak, Jacob A.	Minneapolis
† Poppe, Frederick H.	Minneapolis
§ Potter, Robert B.	Minneapolis
† Pratt, Fred J., Sr.	Minneapolis
§ Pratt, Fred J., Jr.	Minneapolis
§ Prem, Konald A.	Minneapolis
† Preine, Irving A.	Osseo
§ Preston, Paul J.	Minneapolis
§ Price, William E.	Minneapolis
§ Priest, Robert E.	Minneapolis
†§Prim, Joseph A.	Minneapolis
§ Proffitt, William E.	Minneapolis
§ Proshek, Charles E.	Minneapolis
§ Quello, Robert O.	Minneapolis
§ Quiggle, Arthur B.	Minneapolis
*†§Quist, Henry W., Sr.	Minneapolis
§ Quist, Henry W., Jr.	Minneapolis
§ Raile, Richard B.	Minneapolis
§ Ransom, H. Robert	Osseo
§ Ratelle, Alexander E.	Minneapolis
§ Reader, Donald R.	Minneapolis
Redding, Foster K.	Minneapolis
§ Regnier, Edward A.	Minneapolis
§ Reif, Harold A.	Minneapolis
§ Reiley, Richard E.	Minneapolis
§ Remole, William D.	Minneapolis
§ Resch, Joseph A.	Minneapolis
§ Rice, Carl O.	Minneapolis
‡ Rice, Frank B.	Minneapolis
§ Rice, Fred A.	Minneapolis
§ Richdorf, Lawrence F.	Minneapolis
§ Rieke, Wellington W.	Wayzata
Rigler, Leo G.	Minneapolis
Riordan, Elsie M.	Minneapolis
§ Risch, Ronald E.	Minneapolis
§ Rizer, Dean K.	Minneapolis
† Rizer, Robert I.	Minneapolis
Robb, Edwin F.	Minneapolis
§ Robbins, Owen F.	Minneapolis
§ Roberts, Lewis J.	Minneapolis
§ Roberts, Stanley W.	Minneapolis
†§Roberts, William B.	Minneapolis
Robinson, Cortland O.	Minneapolis
Rock, William H.	Minneapolis
§ Rocknem, Robert E.	Minneapolis
§ Rockwell, Curtiss V.	Minneapolis
† Rodda, Fredk. C.	Minneapolis
§ Rodgers, Richard S.	Minneapolis
§ Romness, Kenneth B	Mound

*†Rosander, Phyllis	Minneapolis
§ Rosenbaum, David L.	Minneapolis
§ Rosendahl, Frederick G.	Minneapolis
§ Rosenfield, Abraham B.	Minneapolis
§ Rosenow, John H.	Minneapolis
† Rosenwald, Reuben M.	Anoka
§ Ross, Alexander J.	Minneapolis
§ Rossen, Ralph X.	Minneapolis
Rotenberg, Robert J.	Minneapolis
§ Rothnem, Morris S.	Minneapolis
§ Rucker, William H.	Minneapolis
Rud, Norman E.	Minneapolis
† Rudell, Gustaf L.	Minneapolis
§ Russeth, Arthur N.	Minneapolis
§ Rusten, Elmer M.	Minneapoli
Rydburg, Wayne C.	Minneapol
§ St. Cyr, Harry M., Jr.	Robbinsdale
§ St. Cyr, Kenneth J.	Robbinsdale
§ Sadler, Wm. P., Jr.	Minneapol
‡ Safirescu, Sorin R.	Minneapol
§ Saliterman, Bernard I.	Minneapol
§ Samuelson, Samuel	Minneapol
§ Sandt, Karl E.	Minneapol
§ Sawatzky, William A.	Minneapol
§ Sborov, Abe M.	Minneapol
§ Schaaf, Frederick H. K.	Minneapol
Schaar, Frances E.	Minneapol
§ Schaefer, Kenneth F.	Minneapol
Schaefer, Wesley G.	Minneapol
Schaffhausen, Mildred	Minneapol
† Scheldrup, N. H.	Minneapol
§ Scherer, Leslie Raymond	Minneapol
Scherling, Sidney S.	Minneapol
§ Schiele, Burtrum C.	Minneapol
§ Schissel, Gregory A.	Minneapol
§ Schmidt, W. Robert	Minneapol
† Schmitt, S. C.	Los Angeles, Cal
Schneck, Jack I.	Waukesha, Wisconsi
§ Schottler, Max E.	Minneapol
§ Schroeder, Albert J.	Minneapol
§ Schultz, Alvin L.	Minneapol
§ Schultz, J. Harold	Minneapol
§ Schultz, Peter J.	Minneapol
§ Schulze, William M.	Minneapol
§ Schumacher, John W.	Robbinsdal
§ Schwartz, E. Robert	Minneapoli
§ Schwartz, Virgil J.	Minneapoli
§ Scott, Horace G.	Minneapoli
§ Seaberg, John A.	Minneapoli
Seham, Max	Minneapol
§ Seifert, Milton H.	Excelsio
§ Selck, Wolfgang	Minneapoli
*§Seljeskog, Sigsbee R.	Minneapol
§ Semsch, Robert D.	Minneapoli
§ Shandorf, James F.	Minneapoli
Shaperman, Eva P.	Minneapol
§ Shapiro, Sidney K.	Minneapol
§ Sharp, David	Minneapol
§ Sharpe, Wendell S.	Minneapol
§ Shaw, Howard A.	Minneapol
§ Shea, Andrew W.	Minneapol
Sheldon, Warren N.	Lorain, Ohi
§ Sher, Lewis	Minneapol
§ Sherman, Lloyd F.	Minneapol
Shillington, Maurice A.	Minneapol
§ Shronts, John F.	Minneapol
‡§Sidell, Franklin D.	Butte, Montan
§ Siegmann, William C.	Minneapol
§ Silas, Ralph M.	Minneapol
Silver, John D.	Minneapol
†§Simons, Jalmar	Minneapol
§ Simonson, Donald B.	Minneapol
† Simpson, Ellery De. W.	Phoenix, Ari.
§ Sinykin, Melvin B.	Minneapol
Siperstein, David M.	Minneapol
§ Sisterman, Thomas J.	Minneapol
† Sivertsen, Andrew	Minneapol
*†§Sivertsen, Ivar	Minneapol
§ Skjold, Arthur C.	Minneapol
Smiley, John T.	Minneapol
§ Smisek, Frank M.	Minneapol
Smith, Adam M.	Minneapol
§ Smith, Archie M.	Minneapol
§ Smith, Baxter A., Jr.	Minneapo
§ Smith, Graham G.	Minneapol
† Smith, Homer R.	Minneap
† Smith, Margaret I.	Gardena, Cal
Smith, Norvin R.	Willm
§ Smith, Theodore S.	Minneap
§ Smith, William T.	Minneapo
§ Soderlind, Ragnar T.	Minneapo
§ Solhaug, Samuel B.	Minneap
Solhaug, Samuel B., Jr.	Minneapo
§ Solvason, Harold M.	Minneapo
Spain, W. Thomas	Princeton, N.
§ Spano, Joseph P.	Minneapo
§ Spencer, Bernard J.	Minneapo
§ Spink, Wesley W.	Minneapo
§ Sponsel, Kenath H.	Minneapo
† Spratt, Charles N.	Minneapo
§ Stahr, Aubrey C.	Hopk
§ Stanford, Charles E.	Minneapo
Staub, Henry P.	Minneapo

telter, Lloyd A.	Minneapolis
§ tennes, John L.	Minneapolis
tenstrom, Annette T.	Minneapolis
§ terrie, Norman A.	Minneapolis
§ tewart, Marvin J.	Minneapolis
§ tewart, Rolla I.	Minneapolis
§ toesser, Albert V.	Minneapolis
§ toltz, Robert C.	Minneapolis
† tomel, Joseph	Vacaville, Calif.
tone, Norman F.	Minneapolis
tone, Stanley P.	Minneapolis
† trachauer, Arthur C.	Minneapolis
§ trickler, Jacob H.	Minneapolis
§ trom, Gordon W.	Minneapolis
§ trongren, Delph T.	Minneaoplis
§ tromme, William B.	Minneapolis
trunk, Clarence A.	Minneapolis
turges, Robert L.	Minneapolis
† uhhy, Walter	Minneapolis
ukov, Marvin	Minneapolis
ullivan, Raymond M.	Minneapolis
§ ullivan, Robert E.	Minneapolis
§ wain, Francis M.	Minneapolis
wanson, Roy E.	Minneapolis
§ weetser, Horatio B.	Minneapolis
§ weetser, Theodore H., Sr.	Minneapolis
§ weetser, Theodore H., Jr.	Minneapolis
† weitzer, Samuel E.	Minneapolis
wendseen, Carl G.	Graceville
§ yverton, Jerome T.	Minneapolis
am, Ernest C.	Minneapolis
§ angen, George M.	Minneapolis
aylor, Joseph H.	Minneapolis
aylor, William E.	Minneapolis
eeter, Richard R.	Minneapolis
enner, Robert J.	Minneapolis
homas, George E.	Minneapolis
homes, A. Boyd	Minneapolis
hompson, Arthur	Minneapolis
hompson, Willis H.	Minneapolis
horsen, David S.	Minneapolis
horson, Stuart V.	Minneapolis

§ Thysell, Desmond M.	Minneapolis
Tichy, Fae Y.	Pasadena, Calif.
† Tingdale, August C.	Minneapolis
§ Tinkham, Robert G.	Minneapolis
§ Titrud, Leonard A.	Minneapolis
§ Tobin, John D.	Minneapolis
Toon, Robert W.	Minneapolis
§ Trach, Benedict B.	Minneapolis
§ Trow, James E.	Minneapolis
§ Trow, William H.	Minneapolis
Trueman, Harold S.	Minneapolis
Tsai, Shih Hao	Oak Terrace
§ Tucker, Richard C.	Minneapolis
§ Tudor, Richard B.	Minneapolis
†§Turnacliff, Dale D.	St. Paul
Twomey, John E.	Minneapolis
*§Ude, Walter H.	Minneapolis
†§Ulrich, Henry L.	Minneapolis
§ Ulvestad, Harold S.	Minneapolis
§ Undine, Clyde A.	Minneapolis
Utendorfer, Robert W.	Minneapolis
§ Vermund, Halvor	Minneapolis
Vik, A. Elliott	Minneapolis
§ Vitols, T. M.	Minneapolis
§ Wahlquist, Harold F.	Minneapolis
Waldron, Carl Wm.	Hopkins
§ Wall, Carl R.	Minneapolis
§ Walonick, Albert L.	St. Louis Park
§ Walsh, Francis M.	Minneapolis
§ Walsh, William T.	Minneapolis
§ Wangensteen, Owen H.	Minneapolis
Ward, Percy A.	Minneapolis
Waters, Alvin W.	Minneapolis
§ Watson, C. Gordon	Minneapolis
Watson, Cecil J.	Minneapolis
† Weaver, Myron Mc.	Vancouver, B. C., Canada
§ Webb, Edgar A.	Minneapolis
Webb, Roscoe C.	Minneapolis
§ Webber, Richard J.	St. Louis Park
§ Webber, Lowell W.	Minneapolis
§ Weisberg, Rapheal J.	Minneapolis

§ Wendland, John P.	Minneapolis
Werner, George	Minneapolis
§ Weslowski, Stanley P.	Minneapolis
† West, Catherine C.	Minneapolis
Wetherby, Macnider	Minneapolis
§ Wexler, Harold M.	Minneapolis
§ Wheeler, Robert W.	Minneapolis
Whitacre, John C., II	St. Paul
§ White, Asher A.	Minneapolis
†§White, S. Marx	Minneapolis
§ White, Willard D.	Minneapolis
§ Whitesell, Lloyd A.	Minneapolis
§ Widen, Wilford F.	Minneapolis
† Wilder, Kenneth W.	Minneapolis
§ Wilder, Robert L.	Minneapolis
† Wilder, R. M., Jr.	Minneapolis
§ Wilken, Paul A.	Minneapolis
† Willcutt, Clarence E.	Phoenix, Arizona
† Williams, Robert	New York, N. Y.
Winchell, Paul	Minneapolis
Winther, Nora M. C.	Minneapolis
§ Wippermann, Frederic F.	Minneapolis
†§Witham, Carl A.	Minneapolis
§ Wittich, Frederick W.	Minneapolis
Wohlrabe, Arthur A.	Minneapolis
§ Wohlrabe, A. Cabot	Minneapolis
§ Wolf, Alfred H.	Minneapolis
Wolter, Frederick H.	Minneapolis
§ Wright, Thomas D.	Minneapolis
§ Wright, Wale S.	Minneapolis
§ Wright, William S.	Minneapolis
Wyatt, Oswald S.	Minneapolis
Wynne, Herbert M. N.	Minneapolis
§ Ylvisaker, Ragnvald S.	Minneapolis
§ Yoerg, Otto Wm.	Minneapolis
Yue, Wen Y.	Oak Terrace
§ Zahrendt, O. Lewis	Minneapolis
§ Zarling, V. Richard	Minneapolis
§ Zaworski, Leo A.	Minneapolis
§ Zierold, Arthur A.	Minneapolis
§ Zinter, Ferdinand A.	Minneapolis
§ Ziskin, Thomas	Minneapolis

KANDIYOHI-SWIFT-MEEKER COUNTY MEDICAL SOCIETY

Kandiyohi, Swift, and Meeker Counties

Regular Meetings, third Thursday. Annual Meeting, third Thursday in November.

Number of Members—53

President	
chnell, Frederick S.	Litchfield
Secretary	
Opsahl, Lawrence J.	Willmar
nderson, Richard E.	Willmar
ulick, Ernest J.	Belgrade
ustrian, Sol	St. Paul
osland, Howard G.	Willmar
radley, Nelson J.	Willmar
hunn, Stanley S.	Willmar
aignault, Oscar	Benson
anielson, Karl A.	Litchfield
anielson, Lennox	Litchfield
ille, Donald E.	Iglo, S. D.
ouglas, Kenneth W.	Sandstone
berley, Tobe S.	Benson
llinger, Albert J.	Willmar
edor, Robert D.	Litchfield
rederickson, Alice C.	Willmar

*†Frost, Edward H.	Willmar
§ Gaehe, Milton B.	Clara City
Giere, Silas W.	Benson
§ Gilman, Lloyd C.	Willmar
Griffin, R. P.	Benson
Guy, Jack A.	New London
Helwig, Karl, Jr.	Kerkhoven
§ Hinz, Walter E.	Willmar
§ Hodapp, Robert V.	Willmar
§ Holm, Donald F.	Benson
§ Houts, Joseph C.	Dassel
Jacobs, Douglas L.	Willmar
†§Jacobs, Johannes C.	Willmar
Johnson, Marvin W.	Dassel
Kaufman, Edward J.	Appleton
† Lundblad, Robert M.	Minneapolis
McCarthy, Austin M.	Willmar
Macklin, William E., Jr.	Willmar
Meinert, John K.	Willmar
§ Michels, Roger P.	Willmar

Nash, Eldore B.	Eden Valley
Nelson, Robert H.	Benson
†§O'Connor, Daniel C.	Eden Valley
Olson, Gregory M.	Litchfield
§ Opsahl, Lawrence J.	Willmar
*†Penhall, Fletcher W.	Morton
§ Peterson, Willard E.	Willmar
Porter, Oliver M.	Atwater
§ Proeschel, Ray K.	Willmar
§ Rorem, Joseph A.	Appleton
§ Ruchie, Warren H.	Willmar
Rygh, Harold N.	Atwater
Schnell, Frederick S.	Litchfield
†§Solsem, Frederick N. S.	Spicer
Sorum, F. T.	Willmar
Sutherland, W. H.	New London
Thompson, Russell A.	Cosmos
Wagner, Norman W.	Benson
Wilmot, Cecil A.	Litchfield
Wilmot, Harold E.	Litchfield

LYON-LINCOLN COUNTY MEDICAL SOCIETY

Lyon and Lincoln Counties

Regular Meetings, six-week period in spring and fall. Annual Meeting, November.

Number of Members—25

President	
ee, Norman J.	Tracy
Secretary	
edenstrom, Philip C.	Marshall
odaski, Albert A.	Tyler
ckdale, John E.	Marshall
erguson, William C.	Walnut Grove
ord, Burton C.	Marshall
ray, Frank D.	Marshall

Hedenstrom, Philip C.	Marshall
Hermanson, Peter E.	Hendricks
† Hoidale, Andrew D.	Tracy
Johnson, C. Percy	Tyler
Kreuzer, Titus	Marshall
Larson, Milo H.	Lake Benton
Lee, Norman J.	Tracy
Monson, Leonard J.	Canby
Murphy, Joseph E.	Marshall
Myers, John W.	Canby

Peterson, Kenneth A.	Marshall
Remsberg, R. R.	Tracy
Smith, Lloyd A.	Willmar
Thill, Leonard J.	Balaton
Thompson, Carl O.	Hendricks
†§Vadheim, Alfred L.	Tyler
†§Valentine, Walter H.	Tracy
Wolstan, Simon D.	Minneota
Workman, Warner G.	Tracy
Yaeger, Wilbert W.	Marshall

McLEOD COUNTY MEDICAL SOCIETY

McLeod County

Regular Meetings, third Thursday of each month.

Annual Meeting, third Thursday in December.

Number of Members—20

President	
Huebert, Dan W.	Hutchinson
Secretary	
Bretzke, Carl O.	Hutchinson
§ Bretzke, Carl O.	Hutchinson
§ Brink, Donald M.	Hutchinson
Carroll, John J.	Winsted
† Clement, John B.	Lester Prairie
§ Floersch, Adrian J.	Glencoe
§ Griebie, Grant L.	Brownton
§ Howell, Milton	Glencoe
Huebert, Dan W.	Hutchinson
§ Jensen, Alvin M.	Brownton
§ Klima, William W.	Stewart
§ Lippmann, Elmer W.	Hutchinson
§ Neumaier, Arthur	Glencoe
§ Rayner, Ralph R.	Gle
Sahr, Walter G.	Hutchi
† Scholpp, Otto W.	Hutchi
§ Selmo, Joseph D.	Nor
§ Sheppard, Cbarles G.	Hutchi
§ Smith, George R.	Hutchi
§ Smyth, John J.	Lester Pr
§ Truesdale, Clark W.	Gle

MOWER COUNTY MEDICAL SOCIETY

Mower County

Regular Meetings, last Thursday of every month. Annual Meeting, December.

Number of Members—37

President	
Cronwell, Bernhard J.	Austin
Secretary	
Rosenthal, F. Harold	Austin
§ Anderson, David P.	Austin
§ Anderson, Harold J.	Austin
§ Anderson, Wallace R.	Austin
§ Barber, Tracy	Austin
§ Cronwell, Bernhard J.	Austin
Elliot, Harold J.	Hayfield
§ Fisch, Herbert M.	Austin
§ Flanagan, Leonard G.	Austin
§ Grise, William B.	Austin
Hagen, John D.	Austin
† Havens, John G. W.	Austin
† Hegge, Olav H.	Austin
*†§Hegge, Rolv S.	Austin
† Hertel, Garfield E.	Austin
§ Hesla, Inman A.	Austin
§ Leck, Paul C.	Austin
§ Lommen, Peter A.	Austin
McKenna, Elizabeth M.	Austin
§ McKenna, Jay K.	Austin
† Melzer, George R.	Lyle
‡ Miller, Herman	Reading
Morse, Norton P.	LeRoy
§ Nesse, J. A.	Austin
§ Osborn, Donald O.	Austin
§ Peterson, Stanley C.	A
Peterson, W. H.	A
§ Robertson, Paul A.	A
§ Rosenthal, F. Harold	A
§ Sargent, Edward C.	A
Schneider, Paul J.	A
§ Seery, Thomas M.	A
§ Sheedy, Chester L.	A
§ Stahl, George W.	A
§ Thomson, James M.	A
§ Twiggs, Leo F.	A
§ Van Cleve, Horatio P.	A
Wilson, Franklin C.	Hampton
§ Wright, Robert R.	A

NICOLLET-LE SUEUR COUNTY MEDICAL SOCIETY

Nicollet and Le Sueur Counties

Regular Meetings, not scheduled. Annual Meeting, December.

Number of Members—22

President	
Canfield, Wayne W.	St. Peter
Secretary	
Limbeck, Donald A.	Le Sueur
§ Ager, Ernest A.	LeCenter
*†§Aitkens, Herbert B.	LeCenter
† Branham, Donald S.	Dear Park, Wis.
§ Canfield, Wayne W.	St. Peter
§ Curtis, Rauen A.	LeCenter
† Ericson, Swan	Los Angeles, Calif.
Gislason, Solvig T.	St. Peter
§ Gridley, John W.	Arlington
§ Grimes, Burton P.	St. Peter
Henry, Martin R.	St. Peter
Kath, Reinhard H.	Arlington
§ Lenander, Mellvin E.	St. Peter
§ Limbeck, Donald A.	Le Sueur
§ Nilson, Helmer J.	North Man
§ Olmanson, Edmund G.	St. P
§ Olson, Duane O.	Gav
‡ Orwoll, Harold S.	Ja
§ Sjostrom, Lawrence E.	St. P
§ Sonnesyn, Nels N.	Le S
§ Strathern, Carleton S.	St. P
†§Strathern, Fred P.	St. P
Traxler, J. Felix	Hende
§ Wohlrabe, Clarence F.	North Man

OLMSTED-HOUSTON-FILLMORE-DODGE COUNTY MEDICAL SOCIETY

Regular Meetings, first Wednesday of odd numbered months.

Annual Meeting first Wednesday in November.

Number of Members—513

President	
Bargen, J. Arnold	Rochester
Secretary	
Wellman, William E.	Rocbester
Aaro, Leonard A.	Rochester
§ Achor, Richard W. P.	Rochester
*§Adams, R. Charles	Rochester
Affeldt, Daniel E.	Kasson
Aga, John H.	Rochester
§ Ahlfs, Jacob J.	Caledonia
Alexander, John D., Jr.	Rochester
§ Allen, Edgar V. N.	Rochester
† Ambert, Samuel	Rochester
§ Andersen, Howard A.	Rochester
§ Anderson, Mark J.	Rochester
Anderson, Markham J., Jr.	Rocbester
Anderson, Milton W.	Rochester
§ Baggenstoss, Archie H.	Rochester
Bahn, Robert C.	Rochester
Bain, Robert C.	Rochester
Bair, Hugo L.	Rochester
§ Baker, George S.	Rochester
† Baker, Harry R.	Hayfield
Baker, Hillier L., Jr.	Rochester
†§Balfour, Donald C.	Rochester
§ Balfour, William M.	Rochester
§ Banner, Edward Arthur	Rochester
§ Bargen, J. Arnold	Rochester
§ Barker, Nelson W.	Rochester
Barnes, Arlie R.	Rochester
Barry, Maurice J., Jr.	Rochester
Bartholomew, Lloyd G.	Rochester
§ Bastron, James A.	Rochester
§ Bayard, Edwin D.	Rochester
§ Beahrs, Oliver H.	Rochester
Beckett, Victoria Ling	Detroit, Mich.
Behling, Frederick L.	Rochester
† Benedict, William L.	Rochester
Bennett, Warren A.	Rochester
Berge, Kenneth G.	Rochester
† Berkman, David M.	Oronoco
§ Bernatz, Philip E.	Rochester
§ Bickel, William Harold	Rochester
† Bigelow, Charles E.	Dodge Center
† Birkhead, Newton C.	Rochester
§ Black, B. Marden	Rochester
Blackburn, Charles M.	Rochester
‡ Bonnet, John D.	New Mexico
Bossard, John W.	Rochester
Botham, Richard James	Rochester
Bowers, Dorrance	Rochester
§ Boyd, David A., Jr.	Rochester
‡ Boyd, George K.	New York, N. Y.
‡ Bozanich, Milosh S.	Rochester
† Braasch, William F.	Rochester
§ Brandenburg, Robert O.	Rochester
Braun, Robert A.	Rochester
Broadhent, James C.	Rochester
Broders, C. W.	Rochester
§ Brown, Alex E.	Rochester
§ Brown, Henry A.	Rochester
§ Brown, Joe R.	Rochester
§ Brown, Philip W.	Rochester
Brown, Roland G.	Rochester
§ Brunsting, Louis A.	Rochester
Bruwer, Andre J.	Rochester
Buie, Louis A.	Rochester
§ Burchell, Howard B.	Rochester
Burgerman, Arthur	Rochester
Burich, Harry F.	Rochester
§ Burke, Edmund C.	Roch
Burroughs, John T.	Roch
§ Butt, Hugh R.	Roch
§ Cain, James Clarence	Roch
Callahan, John A.	Roch
Calvert, Wilson C.	Roch
Campbell, Donald C.	Roch
Cantrell, Glenn	Roch
Carlon, Donald L.	Roch
Carr, David T.	Roch
§ Carryer, Haddon McC.	Roch
§ Childs, Donald S., Jr.	Roch
§ Christensen, Norman A.	Roch
Christianson, Bruce W.	Roch
Christoferson, Kent W.	Roch
§ Clagett, O. Theron	Roch
Clark, Edward C.	Roch
§ Clark, Leslie William	Spring V
Clifton, Theodore A.	Chat
Colby, N. Y., Jr.	Roch
§ Comfort, Mandred W.	Roch
† Compton, Russell F.	Roch
Connolly, Daniel C.	Roch
Cook, Roderick W., Jr.	Roch
Cooley, Jack Crain	Roch
Cooner, Talbert	Roch
Corbin, Kendall B.	Roch
Cottone, Francis J.	Roch
§ Coventry, Markham B.	Roch
‡ Craig, Richard M.	Roch
§ Craig, Winchell McK.	Roch
Crumbley, James J., Jr.	Tampa
Culp, Ormond S.	Roch
§ Dahlin, David C.	Roch
Daly, David	Roch

Daugherty, Guy Wilson	Rochester
Davis, Austin C.	Rochester
Davis, George D.	Rochester
Dearing, William H.	Rochester
Decker, Barry	Rochester
Decker, David G.	Rochester
Devine, Kenneth D.	Rochester
DeWeerd, James H.	Rochester
Dickinson, L. S.	Rochester
iessner, Grant Roy	Rochester
ines, David E.	Rochester
ixon, Claude F.	Rochester
ockerty, Malcolm B.	Rochester
odge, Henry W., Jr.	Rochester
onoghue, Francis Edmund	Rochester
ouglass, Bruce E.	Rochester
oyle, James R.	Rochester
rips, Della G.	Oronoco
ry, Thomas J.	Rochester
unn, Jack, Jr.	Urbana, Ill.
uShane, James W.	Rochester
yer, John Allen	Rochester
aton, Lealdes M.	Rochester
delmann, Robert B.	Rochester
dwards, Jesse E.	Rochester
lkins, Earl C.	Rochester
llis, F. Henry	Rochester
lstner, Howard L.	Rochester
mmett, John L.	Rochester
nsrud, Earl Richard	Rochester
rich, John B.	Rochester
rickson, Donald J.	Rochester
sser, Robert A.	St. Charles, Illinois
stes, J. Earle	Rochester
usterman, George B.	Rochester
vans, Harold W.	Rochester
varts, Arrah B.	Rochester
wen, Edgar F.	Rochester
aber, John E.	Rochester
abi, Mario Nestor	Rochester
ailor, Harlan J.	Rochester
aucett, Robert L.	Rochester
aulconer, Albert, Jr.	Rochester
eldmann, Floyd M.	New York, N. Y.
erris, DeWard O.	Rochester
igi, Frederick A.	Rochester
lor, Frank S.	Rochester
oss, Edward Lehmann	Rochester
oulk, William T., Jr.	Rochester
rethem, Allen A.	Rochester
ricke, Robert E.	Rochester
ambill, Carl M.	Rochester
ambill, Earl E.	Rochester
ardner, Gawinn B.	Rochester
ardner, John U.	Rochester
astineau, Clifford F.	Rochester
atchell, Frank G.	Rochester
aunt, William D.	Rochester
ee, Vernon Ray	Rochester
eraci, Joseph Emil	Rochester
hormley, Ralph K.	Rochester
iffin, Herbert Z.	Rochester
iffin, Mary E.	Rochester
ifford, R. W., Jr.	Rochester
insberg, Robert L.	San Antonio, Texas
lew, William Bainbridge	Rochester
lick, Dallas D.	Rochester
oehrs, Homer R.	Rochester
oldstein, Norman P.	Rochester
ood, C. Allen	Rochester
race, Joseph B.	Rochester
ray, Howard K.	Rochester
reen, Paul A.	Rochester
reene, Laurence F.	Rochester
riffiths, Edward K.	St. Paul
rindlay, John H.	Rochester
ross, John B.	Rochester
ahein, Harold C.	Rochester
abein, Harold C., Jr.	Wiesbaden, Germany
agedorn, Albert Berner	Rochester
aines, Samuel F.	Rochester
allberg, Olav Erik	Rochester
allenbeck, Dorr F.	Rochester
allenbeck, George A.	Rochester
anlon, David G.	Rochester
anson, Norbert Orrin	Rochester
ardy, William M.	Rochester
argraves, Malcolm M.	Rochester
rrington, Stuart W.	Rochester
arris, Lloyd E.	Rochester
artman, Howard R.	Rochester
artridge, Virginia B.	Rochester
ayles, Alvin Beasley	Rochester
eck, Frank J.	Rochester
ndrick, William L.	Rochester
ilman, Dorothy M. H.	San Diego, California
eilman, Fordyce R.	Rochester
elland, John W.	Spring Grove
elmholz, Henry F.	Rochester
empstead, Bert E.	Rochester
ench, Philip S.	Rochester
§ Henderson, Edward D.	Rochester
§ Henderson, John W.	Rochester
§ Henderson, Lowell	Rochester
† Henderson, Robert Earl	Rochester
§ Hepper, Norman G.	Rochester
Herbert, Edna E.	Rochester
† Hewitt, Edith S.	Rochester
†§Hewitt, Richard M.	Rochester
† Heyerdale, O. C.	Rochester
Higgins, John A.	Rochester
§ Hill, John Roger	Rochester
† Hill, Richard Woolsey	Rochester
§ Hines, Edgar A., Jr.	Rochester
§ Hodgson, Corrin H.	Rochester
§ Hodgson, John R.	Rochester
Holland, C. R.	Rochester
§ Hollenhorst, Robert W.	Rochester
§ Holman, Colin B.	Rochester
§ Horton, Bayard T.	Rochester
§ Howell, Llewelyn	Rochester
§ Hunt, Arthur B.	Rochester
§ Hunter, James S., Jr.	Rochester
§ Ivins, John C.	Rochester
§ Jackman, Raymond J.	Rochester
Jackson, Sidney C.	Rochester
§ Janes, Joseph M.	Rochester
† Jarvis, Walter H., Jr.	Rochester
Johnson, Adelaide McF.	Rochester
§ Johnson, Carl Eric	Rochester
Johnson, Einer W., Jr.	Rochester
Johnson, Ralph B.	Lanesboro
Jones, Robcliff U., Jr.	Fairfield, Conn.
§ Joyce, George L.	Rochester
§ Judd, Edward Starr, Jr.	Rochester
Juergens, John L.	Rochester
Kearns, Thomas P.	Rochester
§ Keating, Francis Raymond, Jr.	Rochester
§ Keith, Haddow M.	Rochester
†§Keith, Norman M.	Rochester
Kemper, James W.	Rochester
§ Kennedy, Roger L. J.	Rochester
§ Kernohan, James W.	Rochester
Kiely, Joseph M.	Rochester
§ Kierland, Robert R.	Rochester
Kilby, Ralph A.	Rochester
Kirby, Thomas J., Jr.	Rochester
†§Kirklin, Byril R.	Rochester
§ Kirklin, John W.	Rochester
‡ Klass, Donald W.	San Antonio, Texas
Knight, James Harry	Rochester
§ Knutson, Lewis A.	Spring Grove
§ Koelsche, Giles A.	Rochester
† Kragh, Lyle V.	Rochester
Kroboth, Frank J., Jr.	Rochester
Krout, Robert M.	Rochester
§ Krusen, Frank H.	Rochester
Kuhn, Arthur J.	Rochester
§ Kvale, Walter F.	Rochester
§ Lake, Clifford F.	Rochester
† Langrall, Harrison M.	Rochester
Law, William M.	Rochester
Lazarte, Jorge A.	Rochester
§ Leddy, Eugene T.	Rochester
‡ Lescoe, Richard J.	Ellington Air Force Base, Texas
Leuallen, Edmund C.	Rochester
†§Lillie, Harold I.	Rochester
Lillie, John C.	Rochester
§ Lipscomb, Paul R.	Rochester
§ Litin, Edward M.	Rochester
Litzow, Thaddues J.	Rochester
Lofgren, Karl A.	Rochester
†§Logan, Archibald H.	Rochester
§ Logan, George B.	Rochester
Lorton, William L.	Rochester
§ Love, J. Grafton	Rochester
Lundsten, Lloyd R.	Rochester
§ Lundy, John S.	Rochester
Lynn, Thomas E.	Rochester
§ MacCarty, Collin S.	Rochester
†§MacCarty, William C.	Rochester
MacLean, Alexander	Rochester
Madalin, Herbert E.	Rochester
§ Magath, Thomas B.	Rochester
Magness, John L.	Rochester
Manger, William M.	Rochester
Mankin, Harold T.	Rochester
§ Martin, George M.	Rochester
§ Martin, William J.	Rochester
Masson, Duncan M.	Rochester
† Masson, James C.	Rochester
§ Masson, James K.	Rochester
Mathieson, Don R.	Rochester
Matthews, Louis B., Jr.	Rochester
Mayne, John G.	Rochester
§ Mayo, Charles William	Rochester
McBean, J. B.	Rochester
McConahey, William M., Jr.	Rochester
McDonald, John R.	Rochester
McIlhany, Mary Lou	Wheeler, Texas
McKaig, Carle B.	Pine Island
† McKay, John W.	Rochester
McKay, Walter E.	Altadina, Calif.
McLeod, John J., Jr.	Rochester
McSweeny, Austin J.	Danville, Illinois
§ Merritt, Wallace A.	Rochester
† Messer, James W.	Rochester
† Meyerding, Henry W.	Rochester
§ Miller, Roland D.	Rochester
Miller, Ross H.	Rochester
Millikan, Clark H.	Rochester
§ Mills, Stephen D.	Rochester
Moersch, Frederick P.	Rochester
§ Moersch, Herman J.	Rochester
† Moertel, Charles G.	Rochester
§ Montgomery, Hamilton	Rochester
Morgan, Edward R.	Rochester
§ Morlock, Carl G.	Rochester
Morrow, George W., Jr.	Rochester
Mudd, Robert H.	Rochester
Mulder, Donald W.	Rochester
Mussey, Mary E.	Rochester
† Mussey, Robert D.	Rochester
Myers, Cortland, III	Rochester
‡ Myers, Richard L.	Selfridge Air Force Base, Michigan
Myers, Thomas T.	Rochester
Myre, Theodore T.	Rochester
Nehring, Jesse P.	Preston
Nelson, William C.	Rochester
Newnum, Raymond L.	Rochester
Nichols, Donald R.	Rochester
Norris, Neil T.	Caledonia
O'Keefe, Mathew E.	Rochester
*§O'Leary, Paul A.	Rochester
‡§O'Shaughnessy, Edward	Camp Kilmer, N. J.
§ Odel, Howard M.	Rochester
§ Olsen, Arthur M.	Rochester
Olson, Ernest A.	Pine Island
Olson, Grant E.	West Concord
† Onifer, Theodore M.	Rochester
Onsgard, L. Kenneth	Houston
§ Osborn, John E.	Rochester
§ Owen, Charles A. J.	Rochester
‡§Paris, Jaime	Rochester
§ Parker, Harry L.	Rochester
§ Parker, Robert L.	Rochester
Parkhill, Edith M.	Rochester
§ Parkin, Thomas W.	Rochester
Parsons, William B., Jr.	Rochester
§ Patrick, Robert T.	Rochester
§ Paulson, John A.	Rochester
Pearce, Francis M., Jr.	Rochester
Pease, Gertrude L.	Rochester
† Peck, Owen C.	Rochester
†§Pemberton, John	Rochester
§ Perry, Harold	Rochester
† Peterman, Albert F.	Rochester
§ Peters, Gustavus A.	Rochester
§ Petersen, Magnus C.	Rochester
Pettersen, George R.	Mabel
‡ Pettet, John R.	Fort Ord, Calif.
† Phalen, Patrick T.	Rochester
Phillips, Donald F.	Rochester
† Piper, Monte C.	LaCanada, Calif.
Pittelkow, Robert B.	Rochester
§ Polley, Howard F.	Rochester
§ Pool, Thomas L.	Rochester
Pougiales, Mary L. Price	Rochester
‡ Powelson, Myron H.	San Francisco, Calif.
Pratt, George F.	Rochester
§ Pratt, Joseph Hyde, Jr.	Rochester
§ Prickman, Louis E.	Rochester
§ Priestley, James T.	Rochester
§ Pruitt, Raymond D.	Rochester
§ Pugh, David G.	Rochester
Purnell, Don C.	Rochester
§ Ralston, Donald E.	Rochester
§ Randall, Lawrence M.	Rochester
Randall, Raymond V.	Rohcester
§ Rasmussen, Waldemar C.	Rochester
Reed, William B.	Rochester
‡ Reifsnyder, William Henry, III	Rochester
§ Reitemeier, Richard J.	Rochester
§ ReMine, William H., Jr.	Rochester
Reno, George L.	Rochester
Rice, Roberta G.	Minneapolis
Rickman, James H.	Rochester
‡ Ringer, Merritt G., Jr.	Rantoul, Illinois
§ Risser, Alden F.	Stewartville
‡ Roberts, Frank E.	Rochester
† Robinson, Hugh P.	Rochester
§ Rogne, William Gustav	Spring Grove
§ Rome, Howard P.	Rochester
§ Rooke, E. D.	Rochester
Rothwell, Walter S.	Rochester
§ Rovelstad, Randolph A.	Rochester
§ Rucker, Charles W.	Rochester
§ Rushton, Joseph G.	Rochester
Ryan, Robert Frank	Rochester
§ Rynearson, Edward H.	Rochester
Sabin, Frederick Chapman	Rochester
§ Salassa, Robert M.	Rochester
†§Sanford, Arthur H.	Rochester

Sauer, William G.	Rochester
Sayre, George P.	Rochester
Scanlon, Paul W.	Rochester
Schaefer, Joseph C.	Rochester
Scheifley, Charles H.	Rochester
† Schirger, Alexander	Rochester
§ Schmidt, Herbert William	Rochester
† Schneider, James A.	Rochester
§ Scholz, Donald A.	Rochester
Schreiner, Leon H.	Rochester
Sciarra, Paschal A.	Rochester
Scimeca, William B.	Rochester
Scott-Miller, James R.	Rochester
§ Scudamore, Harold H.	Rochester
‡ Seay, James Elbert, III	Big Stone, Texas
‡ Sebrechts, Paul	Great Lakes, Illinois
† Selby, John B.	Rochester
§ Seldon, Thomas H.	Rochester
§ Shick, Richard M.	Rochester
Shields, Jack W.	Rochester
§ Siekert, R. G.	Rochester
‡ Silver, Arthur W.	Southbridge, Mass.
Simmons, William H.	Lexington, Ky.
§ Simonton, Kinsey M.	Rochester
Skaug, Harold M.	Chatfield
§ Slocumb, Charles H.	Rochester
† Smid, Arthur C.	Rochester
†§Smith, Frederick L.	Rochester
†§Smith, Harry L.	Rochester
Smith, John L.	Rochester
§ Smith, Lucian A.	Rochester
Smith, Meredith P.	Rochester
§ Smith, Reginald A.	Rochester
Smith, Ross H., Jr.	Rochester
Smith, William George	Rochester
Sommerville, Robert L.	Rochester
Soshea, John W.	Rochester
§ Soule, Edward H.	Rochester
Spear, Harold C.	New Haven, Conn.
† Sperl, Michael P., Jr.	Rochester
Sprague, Randall G.	Rochester
Stauffer, Maurice H.	Rochester
† Stein, Harold A.	Rochester
§ Steinhilber, Richard M.	Rochester
Steinmetz, Rodney D.	Rochester
Stevens, Grant M.	Rochester
§ Stickeny, J. Minott	Rochester
§ Stilwell, George G.	Rochester
§ Stillwell, George K.	Rochester
Storsteen, Oliver M.	Rochester
§ Stroebel, Charles F., Jr.	Rochester
Stuhler, Louis G.	Rochester
Svare, Gerhart T.	Rochester
Svien, Hendrik J.	Rochester
Symmonds, Richard E.	Rochester
Thompson, Gershom J.	Rochester
Thompson, Murray C.	Rochester
§ Tillisch, Jan H.	Rochester
Traynor, Mack V., Jr.	Rochester
Troup, Richard H.	Rochester
† Turner, John Cooper, Jr.	Rochester
§ Uihlein, Alfred	Rochester
Ulrich, Christian A.	Rochester
§ Underdahl, Laurentius O.	Rochester
Updike, Edwin H., II	Rochester
Utz, David C.	Rochester
§ Van Herik, Martin	Rochester
Vandever, Harry W.	Rochester
§ Vaughn, Louis D.	Rochester
§ Verby, John E.	Rochester
Virnig, Hildegard J.	Caledonia
Vreeland, Oliver H.	Rochester
Wagoner, James M.	Harmony
§ Wakefield, Elmer G.	Rochester
†§Wakim, Khalil G.	Rochest
§ Walters, Waltman	Rochest
§ Ward, Louis E.	Rochest
§ Watkins, Charles H.	Rochest
Watkins, Lee C., Jr.	Rochest
Watson, Eleanor J.	Rochest
Watson, John R.	Rochest
Waud, Robert E.	Rochest
§ Waugh, John McM.	Rochest
§ Weber, Harry M.	Rochest
§ Weed, Lyle A.	Rochest
Weeks, Richard E.	Rochest
† Weiner, Alan D.	Rochest
§ Weir, James F.	Rochest
Welch, John S.	Rochest
§ Wellman, William E.	Rochest
§ Wente, Harold A.	Rochest
§ Westrup, John E.	Lanesbo
§ Whisnant, Jack P.	Rochest
† Wilder, Russell M.	Rochest
Willer, Stanley H.	Rochest
§ Williams, Henry L.	Rochest
§ Wilson, Robert B.	Rochest
§ Wilson, Viktor O.	Rochest
Windesheim, John H.	Rochest
Winn, William E., Jr.	Rochest
† Winter, Malcolm D., Jr.	Rochest
Wollaeger, Eric E.	Rochest
§ Woltman, Henry Wm. F.	Rochest
†§Wood, Harry G.	Rochest
‡ Woodington, George F.	Altoona, Wi
Woodward, Edward, Jr.	Rochest
§ Woolner, Lewis B.	Rochest
Wuest, John H.	Rochest
§ Young, Henry H.	Rochest
Young, John V. W.	Rochest
Zimmer, J. F.	Rochest

PARK REGION DISTRICT AND COUNTY MEDICAL SOCIETY

Douglas, Grant, Otter Tail, Wilkin Counties

Regular Meetings, last Wednesday, even numbered months.
Annual Meeting, December

Number of Members—63

President	
Carlson, Carl E.	Alexandria
Secretary	
Shaver, Ward	Fergus Falls
Arndt, Harry W.	Detroit Lakes
Baker, Jeannette L.	Fergus Falls
Baker, Norman H.	Fergus Falls
† Blakey, Adam R.	Osakis
§ Boline, Clifford A.	Battle Lake
† Boysen, Peter	Bemidji
§ Cain, James H.	Hoffman
§ Carlson, Carl E.	Alexandria
Clifford, George W.	Alexandria
§ Combacker, Leon C.	Fergus Falls
‡§Daehlin, Rolf	Fairchild, Wash.
§ DeKruif, Hendrik	Fergus Falls
§ Doms, Vernon A.	Elbow Lake
Emerson, Edwin E.	Osakis
§ Estrem, Ralph L.	Fergus Falls
§ Estrem, Robert D.	Fergus Falls
§ Geiser, Peter M.	Alexandria
§ Hamlon, John S.	Fergus Falls
Hanson, Everett C.	New York Mills
§ Hanson, LeRoy W.	Pelican Rapids
Heegaard, William G.	Alexandria
§ Heiberg, Emmett A.	Fergus Falls
§ Helseth, Hovald K.	Pelican Rapids
‡ Hom, Leong Y. W.	North Chicago, Ill.
§ Hunt, William	Fergus Falls
§ Jacobson, Clifford W.	Breckenridge
§ Kevern, Jay L.	Henning
Kippen, Neil	Breckenridge
§ Korda, Henry A.	Pelican Rapids
† Larson, Donald	St. Paul
Leibold, Herbert H.	Parkers Prairie
§ Lewis, Arthur J.	Henning
§ Lewis, Charles W.	Henning
Love, Frederick A.	Carlos
§ Lund, Carl J.	Fergus Falls
§ Mahowald, Aloys	Fergus Falls
*†Miller, William Anthony	New York Mills
Mortensen, Nels G.	Minneapolis
§ Mouritsen, Glenn J.	Fergus Falls
† Naegeli, Frank	Fergus Falls
Nelson, Roy A.	Fergus Falls
Nelson, Wilburn O. B.	Fergus Falls
§ O'Brien, Louis T.	Breckenrid
Ostergaard, Erling	Evansvil
Parson, E. Lillian B.	Elbow Lal
Parson, Lester R.	Elbow Lal
† Patterson, William L.	Fergus Fa
† Paulson, Theodore S.	Fergus Fa
‡ Perkins, Douglass E.	Alexandr
Reinhardt, James H.	Alexandr
§ Rockwood, Philo H.	Fergus Fa
§ Sanderson, David J.	Fergus Fa
† Satersmoen, Theodore	Pelican Rapi
§ Sather, Edgar R.	Alexandr
§ Schamber, Walter F.	Parkers Prair
Schoeneberger, P. B.	Perha
Sethre, Arthur E.	Fergus Fa
§ Shaver, Ward	Fergus Fa
§ Sommerness, M. Duane	Fergus Fa
§ Stemsrud, Harold L.	Alexandr
Sutton, Harris R.	Hoffma
§ Tanquist, Edwin J.	Alexandr
Warner, James J.	Perha
§ Wasson, Loren F.	Alexandr
Williams, Winfield T.	Fergus Fa
*†Wray, William E.	Breckenrid

RAMSEY COUNTY MEDICAL SOCIETY

Ramsey County

Regular Meetings, last Monday each month except June, July, August.
Annual Meeting, last Monday in January.

Number of Members—506

President	
Ritt, Albert E.	St. Paul
Secretary	
Gibbs, Edward C.	St. Paul
Executive Secretary	
Olson, Mrs. Eleanor	St. Paul
§ Adair, Albert F., Jr.	St. Paul
† Ahrens, Albert E.	St. Paul
‡§Ahrens, Robert M.	St. Paul
† Alden, John F.	St. Paul
‡ Ambrus, Laszlo	New York, N. Y.
Amerongen, W. W.	St. Paul
§ Arnquist, Andrew S.	St. Paul
§ Arny, Frederick P.	St. Paul
§ Arzt, Philip K.	St. Paul
§ Aurelius, J. Richards	St. Paul
§ Ausman, Duane R.	St. Paul
§ Babh, Frank S.	St. Paul
§ Bacon, Donald K.	St. Paul
§ Baer, Walter	St. Paul
§ Balcome, Milton M.	St. Paul
Barnett, Joseph M.	St Paul
‡ Baronofsky, Ivan D.	St. Paul
† Barsness, Nellie O. N.	St. Paul
Bauer, Eugene L.	St. Paul
†§Beals, Hugh	LaJolla, Calif.
Beck, Charles J.	North St. Paul
§ Beech, Raymond H.	St. Paul
§ Beek, Harvey O.	St. Paul
§ Beer, John J.	St. Paul
§ Bell, Charles C.	St. Paul
§ Bellomo, James	St. Paul
§ Benepe, James L.	St. Paul
*†Bennion, P. H.	Isway, Montana
Benthack, Elaine M.	St. Paul
§ Bentley, Norman P.	St. Paul
Bernier, M. J.	North St. Pa
§ Bernstein, William C.	St. Pa
§ Bicek, Joseph F.	St. Pa
† Binger, Henry E.	Phoenix, Ar
Black, Earl J.	St. Pa
†§Bock, Rolland A.	St. Pa
*†Boeckmann, Egil	St. Pa
§ Bolender, Harold L.	St. Pa
§ Bonello, Frank J.	St. Pa
§ Borg, Joseph F.	St. Pa
† Bouma, Lewis R.	St. Pa
Bouthilet, Florence J.	St. Pa
§ Brand, George D.	St. Pa
† Bray, Elwyn R.	St. Pa
§ Briggs, John F.	St. Pa
§ Broadie, Thomas E.	St. Pa
§ Brodie, Walter D.	St. Pa

Brown, John C.	Los Gatos, Calif.
Buckley, J. J.	St. Paul
Bulinski, Theodore J.	St. Paul
Burch, Edward P., II	St. Paul
Burch, Frank E.	St. Paul
Burklund, Edwin C.	St. Paul
Burlingame, David A.	St. Paul
Burmeister, Richard O.	St. Paul
§Burns, Robert M.	St. Paul
Burton, Carl G.	St. Paul
§Bush, Robert P.	Ft. Benning, Ga.
Busher, Herbert H.	St. Paul
Cain, Clark L.	St. Paul
Calin, Stanford H.	St. Paul
Callahan, Francis F.	St. Paul
Cameron, Dale C.	St. Paul
Canine, James L.	So. St. Paul
Carley, Walter A.	St. Paul
Cedarleaf, Cherry B.	Mahtomedi
Chadbourn, Charles R.	St. Paul
Chatterton, Carl C.	St. Paul
Christensen, Mentor	St. Paul
Christensen, Philip D.	St. Paul
Christiansen, Andrew	St. Paul
Clark, Henry B., Jr.	Minneaplis
Cochrane, Byron B.	St. Paul
Coddon, Walter D.	St. Paul
Cohen, Ellis N.	St. Paul
Colby, Woodward L.	St. Paul
Cole, Wallace H.	St. Paul
Coleman, John B.	St. Paul
Collie, Henry G.	St. Petersburg, Fla.
Connolly, Coleman J.	St. Paul
Connolly, Josepb P.	So. St. Paul
Connor, Charles E.	St. Paul
Cook, C. Kenneth	St. Paul
Cooper, Charles C.	St. Paul
§ Coseriu, Vasile G.	St. Paul
Countryman, Roger S.	St. Paul
Craig, David M.	St. Paul
Critchfield, Lyman R.	St. Paul
Crowley, James H.	St. Paul
Crudo, Vincent D.	St. Paul
Crump, James W.	St. Paul
Culligan, John M.	St. Paul
Culver, L. G.	St. Paul
Davis, Edward V.	St. Paul
Dawson, James R.	St. Paul
Decker, Charles H.	St. Paul
Derauf, Benjamin I.	St. Paul
Deters, Donald C.	St. Paul
Dickson, Thomas H.	St. Paul
Drake, Carl B.	St. Paul
Dunn, James N.	St. Paul
Dunn, Robert C.	St. Paul
Earl, George A.	St. Paul
Earl, John R.	St. Paul
Edwards, Joseph W.	St. Paul
Edwards, Lloyd G.	St. Paul
Edwards, Thomas J.	St. Paul
Eginton, Charles T.	St. Paul
Ely, Orriman S.	So. St. Paul
Emerson, Edward C.	St. Paul
Emmons, R. W.	St. Paul
Endress, Edward K.	St. Paul
Enroth, Oscar E.	St. Paul
Ernest, George C. H.	St. Petersburg, Fla.
Ersfeld, Murray P.	St. Paul
Eshelby, E. C.	St. Paul
Farkas, John V.	St. Paul
Fee, John G.	St. Paul
Feinberg, Milton	St. Paul
Felder, Davitt A.	St. Paul
Felion, Arthur J.	St. Paul
Fesler, Harold H.	St. Paul
Field, Anthony H.	Farmington
Fifer, William J.	St. Paul
Fink, Daniel L.	St. Paul
Fischer, Robert F.	St. Paul
Fisher, Dan W.	St. Paul
Flanagan, Harold F.	St. Paul
Flannery, Hubert F.	St. Paul
Flatt, John B.	St. Paul
Flom, Reynold P.	St. Paul
Flynn, L. L., Jr.	St. Paul
Fogarty, Charles W., Sr.	St. Paul
Fogarty, Charles W., Jr.	St. Paul
Fogelberg, Emil J.	St. Paul
Foley, Frederic E. B.	St. Paul
Forsythe, James R.	St. Paul
Fox, LeRoy J.	St. Paul
Freeman, Charles D., Jr.	St. Paul
Freeman, Gerald I.	St. Paul
Freidman, Louis L.	St. Paul
Fritz, Wallace L.	St. Paul
Froats, Charles W.	St. Paul
Fuller, Benjamin F.	St. Paul
Galligan, John J.	St. Paul
Garbecht, Arthur W.	St. Paul
Gardner, Walter P.	St. Paul
Garrow, Douglas M.	St. Paul
Gehlen, Joseph N.	St. Paul
Gibbs, Edward C.	St. Paul
§ Gillespie, Delmar R.	St. Paul
‡ Gilsdorf, Donald A.	St. Paul
§ Gleason, Wallace A.	St. Paul
Goldsmith, Joseph W.	St. Paul
†§Goltz, Edward V.	St. Paul
§ Grant, Hendrie W.	St. Paul
§ Gratzek, Thomas	St. Paul
§ Grau, R. K.	St. Paul
Gray, Edward F.	White Bear Lake
Hagen, Paul S.	St. Paul
Hakanson, Erick Y.	St. Paul
§ Hall, Barnard	St. Paul
§ Hammes, Ernest M., Sr.	St. Paul
§ Hammes, Ernest M., Jr.	St. Paul
†§Hannon, Donald W.	St. Paul
Harbaugh, John T.	St. Paul
§ Harmon, Gaius E.	St. Paul
§ Hartfiel, William F.	St. Paul
Hartig, Marjorie	St. Paul
*†Hartley, Everett C.	St. Paul
§ Hauser, Victor P.	St. Paul
§ Hayes, Albert F.	St. Paul
§ Heck, William W.	St. Paul
Hedenstrom, Frank G.	St. Paul
Heilig, William R.	St. Paul
Henderson, Arthur J. G.	No. St. Paul
§ Hengstler, William H.	St. Paul
† Hensel, Charles N.	St. Paul
Herman, Samuel M.	St. Paul
§ Heron, Roy C.	St. Paul
§ Herrmann, Edgar T.	St. Paul
Hertz, Myron J.	St. Paul
†§Hilger, Andrew W.	St. Paul
§ Hilger, Jerome A.	St. Paul
Hilger, Laurence D.	St. Paul
§ Hilker, Marcus D.	St. Paul
Hiniker, Louis P.	St. Paul
§ Hochfilzer, John J.	St. Paul
Hodgson, Jane E.	St. Paul
† Holcomb, O. William	St. Paul
§ Hollinshead, W. H.	St. Paul
§ Holmen, Robert W.	St. Paul
§ Holt, John E.	St. Paul
Hopkins, G. Wendell	St. Paul
Howard, Merrill A.	St. Paul
* Howard, Willard S.	St. Paul
§ Howe, Newell W.	St. Paul
§ Hullsiek, Harold E.	St. Paul
§ Hullsiek, Richard B.	St. Paul
§ Hunter, Murray H.	Farmington
Hunter, Samuel W.	St. Paul
§ Hurwitz, Milton M.	St. Paul
Husebye, Kjeld O.	St. Paul
† Ide, Arthur W.	White Bear Lake
Ikeda, Kano	St. Paul
† Ingerson, Carl A.	St. Paul
Jackson, William C.	St. Paul
§ James, Ellery M.	St. Paul
§ James, John W.	St. Paul
§ Janssen, Martin E.	St. Paul
† Jarvis, Bruce W.	St. Paul
Jarvis, Charles W.	St. Paul
Jarvis, Marilyn A.	St. Paul
† Jastram, Rupert M.	St. Paul
Jesion, Joseph W.	Pine River
§ Johanson, Waldemar G.	St. Paul
§ Johnson, Carl E.	St. Paul
Johnson, Carolyn A.	St. Paul
§ Johnson, Herbert W.	St. Paul
† Johnson, Morris B.	St. Paul
Johnson, R. J.	St. Paul
† Jones, E. Mendelssohn	St. Paul
§ Kamman, Gordon R.	St. Paul
Kaplan, David H.	St. Paul
Karon, Irvine M.	St. Paul
§ Kasper, Eugene M.	St. Paul
Katz, Louis J.	Long Beach, Calif.
Keefe, Rolland E.	St. Paul
Kelly, James H.	St. Paul
†§Kelly, John V.	St. Paul
§ Kelsey, Chauncey M.	St. Paul
§ Kenefick, Emmett V.	St. Paul
§ Kenyon, Thomas J.	St. Paul
§ Kesting, Herman	St. Paul
† King, George L.	Hudson, Wisc.
*†§Klein, Henry N.	St. Paul
§ Knutson, Gerhard E.	St. Paul
Knutson, Robert C.	St. Paul
Kodres, Nina	St. Paul
Koza, Donald W.	St. Paul
Krezowski, Thomas K.	St. Paul
§ Kugler, Alex A.	St. Paul
§ Kuske, Albert W.	St. Paul
§ Kusske, Bradley W.	St. Paul
§ Kusske, Douglas R.	St. Paul
Kvitrud, Gilbert	St. Paul
§ Lannin, Bernard G.	St. Paul
§ Lannin, Donald R.	St. Paul
§ Larrabee, Walter F., Jr.	St. Paul
Larson, Eva-Jane Ostergren	St. Paul
Larson, James T.	So. St. Paul
Larson, Kenneth R.	St. Paul
Larson, Martin L.	St. Paul
Laszewski, Franz von Zelberschwecht	St. Paul
Lax, Morris H.	St. Paul
†§Leahy, Bartholomew	St. Paul
§ Leavenworth, Richard O., Sr.	St. Paul
Leavenworth, Richard O., Jr.	St. Louis Park
§ Leick, Richard M.	St. Paul
Leitch, Archibald	St. Paul
§ Lepak, John A.	St. Paul
† Lerche, William	Cable, Wisc.
§ Leven, N. Logan	St. Paul
§ Leverenz, Carleton W.	St. Paul
* Levin, Bert G.	St. Paul
Levitt, George X.	St. Paul
§ Lick, Charles L.	St. Paul
Lick, Louis C.	St. Paul
Lick, William J., Jr.	St. Paul
§ Lien, Richard J.	St. Paul
† Lightbourn, Edgar L.	Hastings
Lilleberg, Norbert J.	St. Paul
§ Lindell, Robert	St. Paul
Lippman, Hyman S.	St. Paul
§ Loken, Selmer M.	St. Paul
Lowe, Earl R.	So. St. Paul
Lowe, Thomas A.	So. St. Paul
§ Lundholm, Arthur M.	St. Paul
§ Lynch, Francis W.	St. Paul
§ McCabe, James S.	St. Paul
§ McCain, Donovan L.	St. Paul
McCarthy, Joseph J.	St. Paul
† McClanahan, James H.	White Bear Lake
McClanahan, Thomas S.	White Bear Lake
McClellan, Robert J.	St. Paul
§ McCloud, Cbarles N.	St. Paul
§ McEwan, Alexander	St. Paul
§ McGroarty, Brian J.	St. Paul
McKenzie, Eva E.	St. Paul
§ McNeill, J. A.	St. Paul
Mackoff, Sam M.	Phoenix, Ariz.
Madland, Robert S.	St. Paul
§ Malerich, J. Anthony	St. Paul
§ Malerich, J. Anthony, Jr.	St. Paul
Marks, Roger W.	St. Paul
§ Martin, Dwight L.	St. Paul
§ Martineau, Joseph L.	St. Paul
Mateo, Guillermo	St. Paul
Matthews, James H.	Minneapolis
§ Mazzitello, William F.	St. Paul
§ Meade, John R.	St. Paul
§ Mears, Burtis J.	St. Paul
§ Medelman, John P.	St. Paul
§ Melancon, Joseph F.	St. Paul
§ Menold, William F.	St. Paul
§ Merner, Thomas B.	Faribault
§ Merrick, Robert L.	St. Paul
†§Meyerding, Edward A.	St. Paul
Michienzi, Leonard J.	St. Paul
‡ Midboe, Gilbert	St. Paul
§ Miller, Albert G.	St. Paul
‡ Miller, William T.	St. Paul
Miller, Z. R.	St. Paul
§ Milnar, Frank J.	St. Paul
Mintz, Charles M.	St. Paul
§ Mishek, Charles J.	St. Paul
§ Moga, John A.	St. Paul
Molander, Herbert A.	St. Paul
§ Monahan, Robert H.	St. Paul
§ Mooney, Robert D.	St. Paul
† Moquin, Marie A.	St. Paul
† Moren, J. Adelaide	St. Paul
Moriarty, Berenice	St. Paul
Moriarty, Cecile R.	St. Paul
§ Muller, A. Eugene	North St. Paul
Mundahl, Harold R.	St. Paul
§ Murphy, Jack T.	St. Paul
§ Nash, Leo A.	St. Paul
Neibergs, Lidija	St. Paul
Neibergs, Pauls	St. Paul
Nelson, Loren E.	St. Paul
† Nelson, Louis A., Sr.	St. Paul
§ Nelson, Louis A., Jr.	St. Paul
Nimlos, Kenneth O.	St. Paul
† Nimlos, Lenore O.	St. Paul
§ Noble, John F.	St. Paul
§ Noble, J. Lawrence	St. Paul
Norman, David D.	St. Paul
Nuebel, Charles J.	St. Paul
Nye, Katherine A.	St. Paul
Nye, Lillian L.	St. Paul
O'Brien, J. C.	St. Paul
† O'Connor, Loren J.	St. Paul
O'Kane, Thomas W.	St. Paul
O'Malley, Valentine	St. Paul
§ O'Reilley, Bernard E.	St. Paul
§ Ockuly, Orville	St. Paul
§ Ogden, Warner	St. Paul
§ Ohage, Justus	St. Paul
§ Olsen, Ralph L.	St. Paul
Olson, Charles A.	St. Paul
§ Ostergren, Edward W.	St. Paul

§ Ouellette, Alfred J. ...... St. Paul
§ Owens, Frederick M., Jr. ...... St. Paul
Paulson, Elmer C. ...... St. Paul
Paulson, Wallace J. ...... Minneapolis
Pearson, Fritz R. ...... St. Paul
§ Pearson, Malcolm M. ...... St. Paul
Pedersen, Arthur H. ...... St. Paul
§ Peltier, Leonard F. ...... Minneapolis
Peterson, David B. ...... St. Paul
§ Peterson, Donald H. ...... St. Paul
§ Peterson, Harold O. ...... St. Paul
Peterson, Joel L. E. ...... St. Paul
Peterson, Roy L. ...... White Bear Lake
†§Plondke, Fred J. ...... White Bear Lake
§ Plotke, Harry L. ...... St. Paul
Polski, Paul G. ...... South St. Paul
Post, Edmund A. ...... St. Paul

Quattlebaum, Frank W. ...... St. Paul

§ Ralph, James R. ...... St. Paul
Ramlow, Ralph M. ...... St. Paul
† Ramsey, Walter R. ...... St. Paul
Rasmussen, Ramby C. ...... St. Paul
§ Ravits, Harold G. ...... St. Paul
§ Rea, Charles E. ...... St. Paul
† Reeves, Melvin M. ...... St. Paul
Reid, James W. ...... South St. Paul
§ Reif, Robert W. ...... White Bear Lake
Richards, Albert M. ...... St. Paul
Richards, Ernest T. F. ...... St. Paul
Richardson, Edward J., Jr. ...... St. Paul
§ Richardson, Robert J. ...... St. Paul
Rick, Paul F. W. ...... St. Paul
Rinkey, Eugene ...... St. Paul
§ Ritchie, Wallace P. ...... St. Paul
§ Ritt, Albert E. ...... St. Paul
§ Roach, Donald E. ...... St. Paul
§ Rogers, Sydney F. ...... St. Paul
Rolig, David H. ...... St. Paul
§ Rollie, Orris O. ...... St. Paul
§ Rosenthal, Robert ...... St. Paul
§ Roth, George C. ...... St. Paul
†§Rothschild, Harold J. ...... St. Paul
Rowe, Clarence J., Jr. ...... St. Paul
§ Roy, Phil C. ...... St. Paul
† Ruhberg, George N. ...... Tarzona, Calif.
§ Rusterholz, Alan P. ...... St. Paul
§ Ryan, John J. ...... St. Paul
§ Ryan, Joseph M. ...... St. Paul

§ Sarnecki, M. M. ...... St. Paul
† Satterlund, Victor L. ...... St. Paul
†§Savage, Francis J. ...... St. Paul
§ Schmidtke, Reinhardt L. ...... St. Paul
† Schoch, Robert B. J. ...... St. Paul
§ Schons, Edward ...... St. Paul
§ Schroeckenstein, Hugo F. ...... St. Paul
†§Schuldt, Frederick C. ...... St. Paul
†§Schulze, Albert G. ...... St. Paul
§ Schwyzer, Hanns C. ...... St. Paul
Schwyzer, Marguerite ...... St. Paul
§ Scott, Eugene E. ...... St. Paul
Sekhon, Mohan S. ...... St. Paul
Sells, Richard J. ...... North St. Paul
*†Senkler, George E. ...... St. Paul
§ Setzer, Hobert J. ...... St. Paul
Shannon, William R. ...... St. Paul
Shelander, Marcus I. ...... St. Paul
† Shellman, John L. ...... Pacific Palisades, Calif.

Short, Jacob ...... St. Paul
Siegel, Clarence ...... St. Paul
§ Simons, Leander T. ...... St. Paul
Singer, Benjamin J. ...... St. Paul
§ Skinner, Abbott ...... St. Paul
† Skinner, Harvey O. ...... St. Paul
§ Smisek, Elmer A. ...... St. Paul
§ Smith, Vernon D. E. ...... St. Paul
§ Snyder, George William ...... St. Paul
§ Sohlberg, Olof I. ...... St. Paul
§ Sommerdorf, Vernon L. ...... St. Paul
Sommers, Ben ...... St. Paul
§ Sorem, Milton B. ...... St. Paul
Soucheray, Philip H. ...... St. Paul
§ Souster, Benjamin B. ...... St. Paul
§ Sowada, Ernest J. ...... St. Paul
Sprafka, Gregory ...... St. Paul
§ Sprafka, Joseph L. ...... St. Paul
§ Sprafka, Joseph M. ...... St. Paul
§ Steinberg, Charles L. ...... St. Paul
§ Sterner, Donald C. ...... St. Paul
§ Sterner, E. R. ...... St. Paul
§ Sterner, John J. ...... St. Paul
Stewart, Alexander ...... St. Paul
§ Stolpestad, Armer H. ...... St. Paul
§ Stolpestad, Herbert L. ...... St. Paul
§ Strand, Jack W. ...... St. Paul
§ Strate, Gordon E. ...... St. Paul
Straus, M. L. ...... St. Paul
§ Strem, Edward L. ...... St. Paul
§ Sturley, Rodney F. ...... St. Paul
† Swanson, John A. ...... St. Paul
Swanson, Lawrence J. ...... St. Paul
§ Swendson, James J. ...... St. Paul
Swenson, Donald B. ...... St. Paul
§ Teisberg, John E. ...... St.
Thompson, Floyd A. ...... St.
Thoreson, M. C. Bernice ...... South St.
§ Tifft, Cyril R. ...... St.
§ Tongen, Lyle A. ...... St.
§ Tracht, Robert R. ...... St.
Travis, James S. ...... St.
§ Tregilgas, Harold R. ...... St.
Tregilgas, Richard B. ...... St.
Ubel, Frank A. ...... St.
Van Bergen, Frederick H. ...... Minnea
Varco, Richard L. ...... St.
Veirs, Dean M. ...... St.
Veirs, Ruby J. S. ...... St.
§ Venables, Alexander E. ...... St.

§ Waas, Charles W. ...... St.
§ Walker, Arthur E. ...... St.
§ Wall, James O. ...... St.
‡§Wallinga, Jack ...... Oakland,
§ Walsh, Edward F. ...... St.
§ Walter, Clarence W. ...... St.
Warren, Cecil A. ...... St.
Watson, P. Theodore ...... St.
§ Watson, William H. A. ...... St.
§ Watson, William J. ...... New
Watz, Clarence E. ...... St.
§ Webber, Fred L. ...... St.
§ Wedes, Deno J. ...... St.
§ Weis, Benjamin A. ...... St.
§ Weisberg, Maurice ...... St.
§ Wenzel, Gilbert P. ...... St.
Westover, D. E. ...... St.
§ Wetzel, Earl V. ...... St.
*†Wilkinson, Stella L. ...... St.
† Williams, Arthur B. ...... St.
§ Williams, Clayton K. ...... St.
Williams, George E. ...... St.
§ Williams, John A. ...... St.
Williams, Richard A. ...... St. Paul
Wilson, J. Allen ...... St.
§ Wilson, James V. ...... St.
† Winnick, Joseph B. ...... St.
§ Witthaus, Melvyn E. ...... Mahtor
§ Wolff, Herman J. ...... St.
Wolkoff, H. J. ...... St.
Word, Harlan L. ...... St.

‡ Yamamoto, Joe ...... Oklahoma City, O
Youngren, Everett R. ...... St.

Zachman, Leo L. ...... St.
Zagaria, James F. ...... St.
†§Zimmermann, Harry B. ...... St.

RED RIVER VALLEY MEDICAL SOCIETY

Kittson, Mahnomen, Marshall, Norman, Pennington, Polk, Red Lake and Roseau Counties
Regular Meetings, quarterly. Annual Meeting, December.

Number of Members—60

President
FEIOAL, WILLIAM M. ...... Thief River Falls
Secretary
SATHER, RUSSELL O. ...... Crookston

Anderson, Wallace E. ...... Clearbrook
§ Behr, Orlo K. ...... Crookston
Berg, Arnold M. ...... Roseau
§ Berge, David O. ...... Roseau
§ Berlin, Anthony S. ...... Hallock
† Biedermann, Jacob ...... Thief River Falls
§ Boyer, George S. ...... Crookston
† Bratrud, Edward ...... Thief River Falls
Brink, Adlai A. ...... Baudette
§ Cameron, John H. ...... Crookston
§ Clapp, Hubert D. ...... Crookston
Covey, Kenneth W. ...... Rochester
§ Dale, Lester N. ...... Red Lake Falls
† Delmore, John L. ...... Roseau
§ Delmore, John L., Jr. ...... Roseau
† Delmore, Robert J. ...... New Orleans, La.
Downing, William C. ...... Crookston
§ Erickson, Eskil ...... Halstad
§ Feigal, William M. ...... Thief River Falls
Flancher, Leon H. ...... Crookston
Greene, Daniel E. ...... Thief River Falls
§ Hirsh, Stanton A. ...... Crookston
† Hollands, William H. ...... Fisher
§ Holmstrom, Carle H. ...... Warren
§ Janecky, Allen G. ...... Baudette
§ Jensen, John A. ...... Crookston
Kinkade, Byron R. ...... Ada
§ Klefstad, Lloyd H. ...... Greenbush
§ Kostick, William R. ...... Fertile
§ Loken, Theodore ...... Ada
§ McDonald, William J. ...... Crookston
† McHardy, Bryson R. ...... Chicago, Ill.
McKaig, Alan M. ...... Red Lake Falls
Martin, George B. ...... Thief River Falls
§ Mercil, William ...... Crookston
Mueller, Donald R. ...... Bagley
† Nelson, Henry E. ...... Crookston
Nelson, Kenneth L. ...... Warroad
§ Nord, J. Erling ...... Hallock
§ Oppegaard, C. L. ...... Crook
Parker, Philip J. ...... Hall
§ Pumala, Erven E. ...... War
§ Reff, Alan R. ...... Crooks
§ Roholt, Christian ...... McInt
‡ Rydland, Arne D. ...... San Diego, Ca
Sather, Edgar L. ...... Foss
Sather, George A. ...... Foss
§ Sather, Richard N. ...... Foss
§ Sather, Russell O. ...... Crooks
Schossow, George W. ...... Ersk
§ Skogerboe, Rudolph B. ...... Karls
Stadem, Clifford ...... Twin Va
§ Starekow, Milton D. ...... Thief River F
Stensgaard, Kermit L. ...... Thief River F
§ Stewart, Donald E. ...... Crooks
§ Thysell, Harold R. ...... Crooks
§ Uhley, Charles G. ...... Crooks
Van Rooy, George T. ...... Thief River F
Wendt, H. Paul ...... Thief River F
§ Wikoff, Howard M. ...... Crooks
*†Wiltrout, Irving G. C

RENVILLE-REDWOOD COUNTY MEDICAL SOCIETY

Renville and Redwood Counties
Regular Meetings, third Tuesday of each month. Annual Meeting, November.

Number of Members—26

President
NELSON, GLENN E. ...... Fairfax
Secretary
HAAS, JACK F. ...... Fairfax

§ Alcorn, William J. ...... Wabasso
§ Alton, Donald ...... Bird Island
§ Anderson, Chester A. ...... Hector
Bessessen, Daniel H. ...... Olivia
§ Billings, Ralph E. ...... Franklin
† Brand, William A. ...... Redwood Falls
§ Ceplecha, Stanley F. ...... Redwood Falls
§ Cosgriff, James A., Sr. ...... Olivia
Cosgriff, James A., Jr. ...... Olivia
§ Diessner, Ardell W. ...... Redwood Falls
§ Dordal, John ...... Sacred Heart
§ Fawcett, Arthur M. ...... Renville
† Flinn, Thomas E. ...... Remer
‡ Furr, Leo O. ...... Long Beach, Calif.
§ Haas, Jack F. ...... Fairfax
§ Hinderaker, Harris P. ...... Bird Island
Johnson, Orville H. ...... Omaha, Nebra
§ Johnson, William E. ...... Morg
§ Knoche, Harvey A. ...... Morg
§ Lenz, Joseph R. ...... Mort
† Mesker, George H. ...... Oli
§ Metz, Donald D. ...... Buffalo La
§ Nelson, Glenn E. ...... Fairf
§ Pierce, Robert B. ...... Renvi
† Preisinger, Joseph W. ...... Dallas, Te
§ Strauchler, Jonas ...... Belvi

RICE COUNTY MEDICAL SOCIETY

Rice County

Regular Meetings, third Tuesday of each month. Annual Meeting, third Tuesday in October.

Number of Members—38

President

R. BURTON A..	Faribault

Secretary

ATON, J. GORDON	Northfield

uer, Paul G.	Faribault
aton, J. Gordon	Northfield
uhl, Heinz H.	Faribault
esgens, Ralph H.	Waterville
ngay, Neil S.	Northfield
gberg, Edward J.	Faribault
ancis, David W.	Morristown
rlow, William L.	Faribault
nson, Adolph M.	Faribault
§ Hanson, John W.	Northfield
† Huxley, Frederick R.	Faribault
§ Kennedy, George L.	Faribault
§ Kolars, James J.	Faribault
‡ Kucera, Louis B.	Colorado Springs, Colorado
Larson, W. G.	Northfield
§ Lende, Norman	Faribault
† Lexa, F. J.	Lonsdale
§ Mears, Robert F.	Northfield
Meyer, Frederick C.	Kenyon
Meyer, Paul F.	Faribault
‡ Meyer, Robert P.	Faribault
§ Moses, Royal R.	Kenyon
§ Nelson, Ernest J.	Lonsdale
§ Nielsen, Alvin M.	Northfield
§ Nuetzman, Arthur W.	Faribault
§ Orr, Burton A.	Faribault
Ozolins, Marta	Faribault
Peterson, D. H.	Northfield
§ Roberts, Stanley E.	Faribault
§ Robilliard, Charles M.	Faribault
Rumpf, Carl W.	Faribault
§ Rysgaard, George M.	Northfield
§ Stevenson, Frank W.	Faribault
§ Street, Bernard	Northfield
Studer, Donald J.	Faribault
§ Traeger, Carl A.	Faribault
§ Weaver, Paul H.	Faribault
§ Wilson, Warren E.	Northfield

ST. LOUIS COUNTY MEDICAL SOCIETY

Carlton, Cook, Itasca, Lake and St. Louis Counties

Regular Meetings, second Thursday, except July and August.

Annual Meeting, second Thursday in January.

Number of Members—280

President

ANCO, A. J., SR.	Duluth

Secretary

RGAN, R. O.	Duluth

Executive Secretary

RS. MAROARET B. GILBERT	Duluth

raham, Arden L.	Duluth
ams, Bertram S.	Hibbing
dy, Edward R.	Gilbert
ola, Kenneth E.	Hibbing
rens, Curtis F.	Duluth
ison, David D.	Duluth
ert, Abraham E.	Virginia
drew, William F.	Duluth
tonow, Arthur M.	Virginia
ko, Joseph L.	Hibbing
a, Joseph J.	Duluth
nens, Alvin G.	Duluth
nore, William G.	Duluth
fderheide, Arthur C.	Duluth
ckus, Reno W.	Nopeming
gley, Charles M.	Duluth
gley, Elizabeth C.	Duluth
gley, William R.	Duluth
ch, Velemir M.	Coleraine
kkila, Henry E.	Duluth
don, Richard	Duluth
ker, John D.	Duluth
rnes, Richard E.	Aurora
ney, Leon A.	Duluth
rett, Earl	Duluth
tzen, Peter J.	Duluth
ker, Fredk. T.	Duluth
nell, Otto E.	Virginia
oko, Marie K.	Cloquet
dez, George L.	Duluth
gan, R. O.	Duluth
nco, Anthony J., Sr.	Duluth
nco, Anthony J., Jr.	Rochester
et, Henry E.	Grand Rapids
ckmore, Sidney C.	Biwabik
om, Joseph	Silver Bay
z, J. Arnold	Grand Rapids
man, Paul G.	Duluth
nner, John L.	Eveleth
uchelle, McLemore	Virginia
wen, Robert L.	Hibbing
yea, Lyle H.	Man, West Virginia
yer, Sam H., Sr.	Duluth
yer, Sam H., Jr.	Duluth
un, Ohrmundt C.	Grand Rapids
y, Philip N.	Duluth
ckway, Roger W.	Grand Rapids
oker, Warren J.	Duluth
chanan, Gerald S.	Ft. Benning, Ga.
ckley, Robert P.	Duluth
rleigh, Edward G.	Eveleth
tler, John K.	Cloquet
ntwell, William F.	International Falls
ermak, Francis G.	International Falls
ittum, John R.	Aurora
ristensen, Clarence H.	Duluth
iacy, Edward W.	Ely
rk, Clarence L.	Duluth
rk, Elizabeth A.	Duluth
rk, Ivan T.	Duluth
ll, James J.	Duluth
llins, Arthur N.	Duluth
nley, Francis W.	Duluth
pe, Hershel E.	Minneapolis
wan, George M.	Duluth
§ Coventry, William D.	Duluth
§ Detjen, Edward D.	Bigfork
§ Dickson, Franklin H., Jr.	Proctor
Doxsee, George C.	Chisholm
§ Dwyer, John J.	Duluth
§ Eckman, Philip F.	Duluth
§ Eckman, Ralph J.	Duluth
§ Eisenman, Walter	Hibbing
† Ekblad, John William	Duluth
§ Eklund, Carl D.	Duluth
§ Elias, Frank J.	Duluth
§ Emanuel, Karl William	Duluth
Eppard, Raymond M.	Cloquet
§ Erickson, George P.	Hibbing
§ Erickson, Vernon D.	Grand Rapids
§ Erskine, Gordon M.	Grand Rapids
§ Evensta, John B.	Grand Rapids
§ Farley, Frank G.	Hibbing
§ Fawcett, Keith R.	Duluth
§ Fellows, Manley F.	Duluth
Ferrand, Paula T.	Moose Lake
Ferrell, Clarence R.	Grand Rapids
§ Feuling, John C.	Duluth
§ Fifield, Malcolm M.	Duluth
§ Fischer, Mario McC.	Duluth
§ Fisketti, Henry	Duluth
§ Flynn, Bernard F.	Hibbing
§ Fredericks, Merriam G.	Duluth
§ French, Bayard T.	Hibbing
§ Fuller, Josiah	Duluth
§ Gillespie, Malcolm G.	Duluth
§ Goldish, Daniel R.	Duluth
§ Goldish, Robert J.	Duluth
§ Goodman, Charles E.	Virginia
§ Gowan, Lawrence R.	Duluth
†§Graham, Archibald W.	Chisholm
§ Grahek, Jack P.	Ely
§ Granquist, Richard D.	Coleraine
§ Grinley, Andrew V.	Grand Rapids
Grohs, William H.	Duluth
§ Haavik, John E.	Duluth
Halbert, John J.	Duluth
§ Halliday, Phillip V.	Minneapolis
§ Halper, Bernard	Hibbing
† Haney, Claude L.	Duluth
§ Hansen, Robert E.	Hibbing
Hanson, Ernest O.	Cloquet
§ Harrington, Vernon A.	Duluth
§ Harris, Carl N.	Hibbing
†§Hatch, Walter E.	Duluth
*§Hedberg, Gustaf A.	Nopeming
Heiam, William C.	Cook
§ Hilding, Anderson C.	Duluth
† Hill, Frederick E.	Riverside, Calif.
Hill, John P.	Virginia
Hirschboeck, Frank J.	Duluth
§ Hoff, Herbert O.	Duluth
§ Hoover, Norman W.	Virginia
§ Houkom, Samuel S.	Duluth
Hult, John E.	Cloquet
Hutchinson, Henry	Moose Lake
† Indihar, John E.	Minneapolis
§ Ireland, Gerald W.	Nashwauk
§ Jacobson, Clarence	Chisholm
§ Jacobson, Ferdinand C.	Duluth
§ Jensen, Thorvold J.	Duluth
§ Jeronimus, Henry J.	Duluth
Jessico, Charles M.	Duluth
§ Joffe, Harold H.	Virginia
† Johnsen, Henry A., Jr.	Edina
§ Johnson, Karl E.	Duluth
§ Johnsrud, Luverne W.	Hibbing
§ Johnston, Henry W.	Virginia
*†Johnston, Rufus O.	Gainesville, Fla.
§ Jolin, Francis M.	Bovey
Juntunen, Roy R.	Duluth
§ Karges, L. E.	Grand Rapids
§ Kelley, Robert T.	Nashwauk
§ Kelley, Walter	Duluth
§ Klein, Harry	Duluth
§ Klein, William A.	Duluth
§ Knapp, Frank N.	Duluth
Knoedler, John P.	Duluth
§ Kohlbry, Carl O.	Duluth
Koskela, Lauri E.	Keewatin
§ Kotchevar, Frank R.	Eveleth
Kozberg, Oscar	Moose Lake
§ Krueger, Victor R.	Nopeming
Kruger, Elmer L., Jr.	Hibbing
§ LaBree, Robert H.	Duluth
†§Laird, Arthur T.	Duluth
Larson, Keith D.	Moose Lake
§ Latterell, Kenneth E.	Duluth
§ Law, Harrison E.	Virginia
§ Leek, Joseph H.	Duluth
Lepak, Francis J.	Duluth
Leppo, N. Erkki A.	Duluth
† Lipinski, Stanley W.	Memphis, Tenn.
§ Litman, Samuel N.	Duluth
† McCarty, Paul D.	Ely
† McCoy, Mary K.	Duluth
† McDonald, Archibald	Duluth
§ McDonald, Owen G.	Duluth
§ McHaffie, Orval L.	Duluth
§ McKenna, John J.	Virginia
§ McKenna, Maurice J.	Grand Rapids
§ McNutt, John R.	Duluth
§ MacRae, Gordon C.	Duluth
§ Magney, Fredolph H.	Duluth
Magraw, Richard M.	Minneapolis
§ Malmstrom, John A.	Virginia
*†Marcley, Walter J.	Minneapolis
§ Marrone, Patrick H.	Duluth
§ Martin, Webster C.	Duluth
§ Martin, William B.	Duluth
§ Mast, Frederic L.	Chisholm
§ Mayne, Roy M.	Nopeming
† Mead, Charles H.	Duluth
§ Merriman, Lloyd L.	Duluth
§ Miettunen, John B.	Chisholm
Moe, Thomas	Moose Lake
§ Moehring, Henry G.	Duluth
Mollers, Theodore P.	Soudan
Monroe, Paul B.	Cloquet
§ Monserud, Nels O.	Cloquet
§ Morsman, L. William	Hibbing
§ Moyer, John B.	Duluth
Munson, Martin S.	Barnum
§ Murray, Robert A.	Hibbing
Nakamura, James Y.	Deer River
§ Neff, Walter S.	Virginia
* Nelson, Robert L.	Duluth
§ Nicholson, Murdoch A.	Duluth
§ Nisius, George F.	Duluth
§ Norberg, Carl E.	Cloquet
§ Nollet, Donald J.	Hibbing
§ Nutting, Roland E.	Duluth
§ O'Neill, John C.	Duluth
§ Olson, Albert E.	Duluth
§ Olson, Archie O.	Duluth
Owens, Ben P.	Hibbing
† Paciotti, Vincent J.	Minneapolis

§ Papermaster, Ralph	Two Harbors
§ Parson, E. Irvine	Duluth
§ Pasek, Antone W.	Cloquet
§ Patch, Orien B.	Duluth
† Pearsall, R. P.	Virginia
§ Pedersen, Roy C.	Duluth
† Pennie, Daniel F.	Duluth
Peterson, Edward N.	Virginia
§ Peterson, John H.	Duluth
§ Pierce, Jack R.	Virginia
§ Power, John E.	Duluth
§ Power, John E., Jr.	Duluth
Puumala, Reino H.	Cloquet
† Raadquist, Charles S.	Hibbing
Raattama, John W.	Nashwauk
Rajala, Arnold I.	Grand Rapids
§ Reed Paul	Virginia
§ Richter, David J.	Virginia
* Rokala, Henry E.	Virginia
Rowe, Olin W.	Duluth
§ Rowles, Everett K.	Coleraine
§ Rudie, Peter S.	Duluth
§ Rudie, William D.	Duluth
§ Runquist, John M.	Duluth
Ryan, William J.	Duluth
§ Sach-Roaitz, Alvan	Moose Lake
§ Salter, Reginald A.	Virginia
† Sanford, John B.	Chicago, Illinois
§ Sarff, Oliver E.	Duluth
Sax, Milton H.	Duluth
Sax, Simon G.	Duluth
§ Schirber, Martin J.	Grand Rapids
§ Schmid, John F.	Duluth
§ Schneider, Laurence E.	Duluth
† Schroder, C. H.	Pottstown, Penn.
§ Schweiger, Theodore R.	Hibbing
§ Seashore, R. T.	Duluth
§ Sher, David A.	Virginia
‡ Shirai, Shohei	Coleraine
§ Siegel, John S.	Virginia
§ Sinamark, Andrew	Hibbing
§ Sisler, Clifford E.	Grand Rapids
§ Smith, Cyril M.	Duluth
Smith, Wallace R.	Grand Marais
Snyker, Omer E.	Ely
§ Spang, Anthony J.	Duluth
§ Spang, James S.	Duluth
§ Spang, William M.	Duluth
§ Stein, William A.	Ely
§ Storsteen, Kenneth A.	Duluth
† Strathern, Moses L.	Gilbert
§ Strauss, Eugene C.	Duluth
Streitz, John M.	Duluth
§ Strewler, Gordon J.	Duluth
§ Strobel, William G.	Dulu
§ Sutherland, Harry N.	E
§ Swedberg, William A.	Dulu
§ Swenson, Arnold O.	Dulu
§ Teich, Kenneth W.	Dulu
§ Terrell, Bernard J.	Nopemi
§ Tetlie, James P.	Dulu
§ Thomas, John V.	Dulu
§ Thouin, Laurence G.	Hibbi
* Tingdale, Carlyle	Hibbi
§ Tomhave, Wesley G.	Hibbi
§ Tosseland, Noel E.	Dulu
Tuohy, Edward L.	Santa Barhara, Cal.
§ Urberg, Sofus E.	Dulu
Van Ryzin, Donald J.	Dulu
§ Walder, Harold J.	Dulu
† Walker, Alfred E.	St. Pa
§ Wallace, Martin O.	Dulu
§ Walter, Frederick H.	International Fa
§ Wells, Arthur H.	Dulu
§ Wheeler, Daniel W.	Dulu
‡§Williams, Bruce F. P.	Dulu
Winter, John A.	Dulu
§ Wolff, John M.	Dulu
§ Young, Thomas O.	Dulu
Zemmers, Roberts	Dulu
§ Zupanc, Edward	Dulu

SCOTT-CARVER COUNTY MEDICAL SOCIETY

Scott and Carver Counties
Regular Meetings, third Wednesday of every month, except July and August.
Annual Meeting, third Wednesday in June.
Number of Members—31

President	
STAHLER, PAUL A.	Jordan
Secretary	
RIESCHL, ELIZABETH K.	Jordan
Bratholdt, James W.	Watertown
† Buck, Frederick H.	Shakopee
§ Cervenka, Charles F.	New Prague
Clarke, John W.	Watertown
§ Doherty, Elmer M.	New Prague
§ Hebeisen, Milton B.	Chaska
Heinz, Ivy B.	Shakopee
Heinz, Lawrence H.	Shakopee
Heinzerling, Carl R.	Chaska
§ Juergens, Herman M.	Belle Plaine
§ Kucera, Stanley T.	Northfield
Larson, Leighton W.	Waconia
Lukk, Olaf	Montgomery
†§Martin, Thomas Philip	Arlington
Nagel, Harold D.	Minneapolis
Ninneman, Newton N.	Waconia
† Novak, Edward E.	New Prague
Olson, Chester J.	Belle Plaine
§ Pearson, Bror F.	Shakopee
Philp, David R.	Watertow
Pogue, Richard E.	Watertow
§ Ponterio, James E.	Shakope
Rieschl, Elizabeth K.	Jorda
§ Rynda, Edwin R.	New Pragu
Sawaryniuk, Iwan	Waconi
Schimelpfenig, George T.	Chask
Simmonds, Harry N.	Prior Lak
§ Simons, Bernard H.	Chask
Stahler, Paul A.	Jorda
†§Westerman, Alvin	Montgomer
§ Westerman, Fred	Montgomer

SOUTHWESTERN MINNESOTA MEDICAL SOCIETY

Cottonwood, Jackson, Murray, Nobles, Pipestone, and Rock Counties
Regular Meetings, on call. Annual Meeting, October.
Number of Members—63

President	
CHRISTIANSEN, HAROLD A.	Jackson
Secretary	
HEIBERG, OLAF M.	Worthington
§ Arnold, Elmer W.	Adrian
§ Bader, J. L.	Slayton
§ Basinger, Harold P.	Windom
Basinger, Harvey R.	Mountain Lake
§ Basinger, Homer P.	Windom
§ Beckering, Gerrit	Edgerton
§ Benjamin, Walter G.	Pipestone
§ Bofenkamp, F. William	Luverne
§ Boone, Ervin S.	Luverne
† Brown, Alexander H.	Pipestone
‡ Buresh, Kenneth L.	Columbus, Ga.
§ Carlson, John V.	Westbrook
§ Christiansen, Harold A.	Jackson
§ Dawson, Lorin D.	Worthington
Dokken, James H.	Windom
Doman, Victor W.	Lakefield
Hallin, Roger P.	Worthington
§ Halloran, Walter H.	Jackson
§ Halpern, David J.	Brewster
Harada, Thomas T.	Lake Wilson
§ Harrison, Percy W.	Worthington
§ Heiberg, Olaf M.	Worthington
§ Hoyer, Ludolf J.	Windom
§ Karleen, Bernard N.	Jackson
§ Keyes, Robert W.	Pipestone
§ Kilbride, Edwin A.	Worthington
§ Koenecke, Fred H.	Lakefield
§ Kotval, Russell J.	Pipestone
§ Laikola, Leslie A.	Adrian
§ Lohmann, John G.	Pipestone
§ Maitland, Edwin T.	Jackson
† Manson, Frank M.	Worthington
§ Martin, Albert C.	Luverne
§ Minge, Raymond K.	Worthington
§ Nealy, Donald E.	Adrian
§ Nicholson, Richard W.	Heron Lake
§ Nywall, Dean D.	Slayton
§ Odland, Donald M.	Luverne
§ Pankratz, Peter J.	Mountain Lake
§ Patterson, Hugh D.	Slayton
§ Pierson, Roy F.	Slayton
§ Piper, William A.	Mountain Lak
Plucker, Milton W.	Worthingtor
‡ Ritzinger, Fredk. R.	Randolph Air Force Base, Texa
§ Robinett, Robert W.	Worthingtor
§ Rohrer, Christian A.	Worthingtor
§ Rose, John T.	Lakefielc
Runquist, Richard K.	Westbrook
§ Sawtell, Robert R.	Worthington
§ Schade, Fredk. L.	Worthington
§ Schutz, Elmer S.	Mountain Lake
§ Sherman, Charles L.	Luverne
§ Slater, Sidney A.	Worthington
§ Sogge, Ludwig L.	Windom
§ Stam, John	Worthington
§ Stanley, Court R.	Richfield
Stevenson, Basil M.	Fulda
§ Stratte, Harold C.	Windom
Vix, Vernon A.	Worthington
§ Wells, Walter B.	Jackson
§ Williams, Charles A.	Pipestone
† Williams, Leon A.	Minneapolis
‡§Zeller, Nicholas H.	New York, N. Y.

STEARNS-BENTON COUNTY MEDICAL SOCIETY

Stearns and Benton Counties
Regular Meetings, third Thursday of month. Annual Meeting, December.
Number of Members—68

President	
SISK, HARVEY E.	St. Cloud
Secretary	
PETERSEN, ROBERT T.	St. Cloud
Alden, W. Charles.	Kimball
§ Anderson, Ernest M.	St. Cloud
Andrews, Bernice F.	Holdingford
§ Autrey, William A.	St. Cloud
§ Baumgartner, Florian H.	Albany
§ Beuning, John B.	St. Cloud
*†Brigham, Charles F., Sr.	St. Cloud
§ Brigham, Charles F., Jr.	St. Cloud
Broker, Henry M.	St. Cloud
§ Buscher, Julius C.	St. Cloud
‡§Cesnik, Robert J.	St. Cloud
Chadbourn, Wayne A.	St. Cloud
§ Clark, Harry B.	St. Cloud
Cleaves, William D.	Sauk Centre
§ Donaldson, Charles S.	St. Cloud
§ Dredge, Thomas E.	St. Cloud
DuBois, Julian F., Sr.	Sauk Centre
DuBois, Julian F., Jr.	Sauk Centre
§ Evans, Leslie M.	Sauk Rapids
Fidelman, Norman E.	Foley
†§Fleming, Thomas N.	St. Cloud
§ Gaida, Joseph B.	St. Clou
§ Goehrs, Gilman H.	St. Cloud
† Goehrs, Henry W.	St. Cloud
Grant, John C.	Sauk Centre
† Haberman, Emil	Osaki
Halenbeck, Philip L.	St. Cloud
Hedlund, Charles J.	Minneapolis
Henry, Clarence J.	Milaca
‡ Henry, J. E.	Milaca
Hoehn, David	Holdingford
†§Jones, Richard N.	St. Cloud
Keith, Paul J.	Milaca

Kelly, John F.	Cold Spring
Koenig, Robert P.	Geneva, N. Y.
Kohler, Delphin W.	Tacoma, Wash.
Koop, Herman	Cold Spring
Kuhlmann, Lawrence B.	Melrose
LaFond, Edward M.	St. Cloud
Lewis, Claude B.	St. Cloud
Libert, John N.	St. Cloud
Lindeman, R. J.	Paynesville
Loes, Louis A.	St. Cloud
Luckemeyer, Carl J.	St. Cloud
McDowell, John P.	St. Coud
Meyer, Anthony A.	Melrose
§ Milhaupt, E. N.	St. Cloud
Mueller, Rudoph B.	Richmond
§ Musachio, Nicholas F.	Foley
Myre, Clifford R.	Paynesville
§ Neils, Vernon E.	Sauk Rapids
§ Nessa, Curtis B.	St. Cloud
Nietfeld, Aloys	Sauk Centre
§ O'Keefe, James P.	St. Cloud
§ Petersen, Robert T.	St. Cloud
Phares, Otto C.	St. Cloud
§ Raetz, Sylvester J.	Maple Lake
§ Reif, Henry J.	St. Cloud
§ Richards, William B.	St. Cloud
Salk, Richard J.	Albany
†§Sandven, Nels O.	Paynesville
† Schatz, Francis J.	St. Cloud
† Sherwood, George E.	Kimball
§ Sisk, Harvey E.	St. Cloud
†§Stangl, Philip E.	St. Cloud
§ Thuringer, Carl B.	St. Cloud
§ Walfred, Karl A.	St. Cloud
§ Wenner, Waldemar T.	St. Cloud
§ Wittrock, Louis H.	Watkins
Zachman, Albert H.	Melrose

STEELE COUNTY MEDICAL SOCIETY

Steele County

Regular Meetings, called by the officers. Annual Meeting, January.

Number of Members—22

President	
ARNESEN, JOHN F.	Owatonna
Secretary	
DEWEY, DONALD H.	Owatonna
Anderson, Franklin C.	Owatonna
Arnesen, John F.	Owatonna
Dewey, Donald H.	Owatonna
rtel, Edward Q.	Ellendale
§ Fischer, John R.	Blooming Prairie
§ Halvorsen, Daniel K.	Owatonna
Hartung, Elmer H.	Claremont
Henry, Kenneth G.	Owatonna
Honath, Donald H.	Owatonna
Kulstad, Oscar	Dodge Center
‡ Kurtin, Joseph J.	New York, N. Y.
§ Lundquist, Curt W.	Owatonna
§ McEnaney, Clifford T.	Owatonna
§ McIntyre, John A.	Owatonna
†§Melby, Benedik	Blooming Prairie
† Morehead, Dewey E.	Owatonna
§ Olson, Albert J.	Owatonna
§ Roberts, Oliver W.	Owatonna
§ Schaefer, Joseph F.	Owatonna
† Senn, Edward W.	Owatonna
§ Stransky, Theodore W.	Owatonna
†§Wilkowske, Rudolph J.	Owatonna

UPPER MISSISSIPPI MEDICAL SOCIETY

Aitkin, Beltrami, Cass, Clearwater, Crow Wing, Hubbard, Koochiching, Lake of the Woods, Morrison, Todd and Wadena Counties

Annual Meeting, January.

Number of Members—77

President	
DAVIS, LUTHER F.	Wadena
Secretary	
BADEAUX, GEORGE I.	Brainerd
Anderson, Werner W.	Brainerd
Badeaux, George I.	Brainerd
Bender, James H.	Brainerd
Benson, Alfred H.	Little Falls
Bolstad, Owen C.	Little Falls
Borgerson, Artbur H.	Long Prairie
Brown, Hector M.	Texas
Cardle, George E.	Brainerd
Closuit, Frederick C.	Aitkin
Cook, Jay M.	Staples
Coombs, Carl H.	Cass Lake
Craig, Clair C.	International Falls
Cushing, Robert L.	Brainerd
Davis, Lloyd T.	Wadena
Davis, Luther F.	Wadena
Deweese, Wilford J.	Bemidji
iler, John	Park Rapids
rickson, Alvan O.	Long Prairie
itzsimons, William E.	Brainerd
ortier, George M. A.	Little Falls
ranklin, Gordon W.	Northome
Garlock, Arthur V.	Bemidji
Garlock, DeWitt W.	Highlands, Calif.
† Ghostley, Mary C.	Bemidji
† Gilmore, Rowland	Crookston
Griffin, John W.	Bemidji
Groschupf, Theodore P.	Bemidji
§ Grose, Frederick N.	Clarissa
Halme, William B.	Wadena
§ Hanover, Ralph D.	International Falls
Hartjen, Jason K.	Bemidji
Higgs, Walter W.	Park Rapids
Hoganson, Donald E.	Bemidji
† House, Zachariah E.	Burbank, Calif.
§ Hughes, Bernard J.	Brainerd
§ Johnson, Douglas L.	St. Paul
† Johnson, Einar W.	Bemidji
Johnstone, William W.	Ah-gwah-ching
§ Kanne, Earl R.	Brainerd
Kinports, Edward B.	International Falls
§ Knight, Edwin G.	Swanville
Larson, LeRoy	Bagley
Lee, Hubert W.	Brainerd
§ Lenarz, Albert J.	Browerville
Lofstrom, Dennis E.	Pine River
Longfellow, Helen W.	Brainerd
Lund, Werner J.	Staples
Lundsten, Leslie C.	Bemidji
§ McLane, William O.	Brainerd
§ MacDonald, Roger A.	Littlefork
§ Meller, Maurice	Brainerd
Mortenson, Howard O.	Menahga
§ Mosby, Maurice E.	Long Prairie
§ Mulligan, Arthur M.	Brainerd
† Nelson, Nesmith P.	Minneapolis
O'Leary, John B.	Brainerd
Olson, Lillian A.	Ah-gwah-ching
Parker, C. W.	Wadena
§ Parker, Warren E.	Sebeka
Pedersen, Robert L.	Brainerd
Pierce, Cbarles H.	Wadena
§ Quanstrom, Virgil E.	Brainerd
§ Ringle, Otto F.	Walker
Schmitz, Glen P.	Little Falls
Schwyzer, Arnold G.	St. Paul
Simons, Edwin J.	Edina
Skaife, William F.	Little Falls
§ Stein, Raymond J.	Pierz
Stoy, Robert A.	Little Falls
* Thabes, John A., Jr.	Brainerd
§ Watson, Alexander M.	Royalton
† Watson, Percy T.	Miami, Fla.
Watson, Sydney W.	Royalton
Whittemore, Dexter D.	Bemidji
§ Will, Charles B.	International Falls
§ Will, W. W.	Bertha
Williams, M. M.	Ah-gwah-ching
Wilson, Robert E.	No. Little Rock, Ark.

WABASHA COUNTY MEDICAL SOCIETY

Wabasha County

Annual Meeting, first Thursday after first Monday in October.

Number of Members—14

President	
OUQUET, BERTRAM J.	Wabasha
Secretary	
LESCHE, BERNARD A.	Lake City
ayley, E. Covell	Lake City
ouquet, Bertram J.	Wabasha
§ Bowers, Robert N.	Lake City
† Collins, Joseph S.	Wabasha
§ Ekstrand, LeRoy M.	Wabasha
§ Ellis, Earl Wm.	Elgin
§ Flatte, John B.	Wabasha
§ Flesche, Bernard A.	Lake City
§ Gjerde, William P.	Lake City
Glabe, Robert A.	Plainview
§ Mahle, Donald G.	Plainview
§ Ochsner, Clarence G.	Wabasba
† Replogle, W. H.	Los Angeles, Calif.
§ Sontag, David W.	Lake City

WASECA COUNTY MEDICAL SOCIETY

Waseca County

Regular Meetings, as decided. Annual Meeting, January.

Number of Members—9

President	
OTTINGER, RAYMOND C.	Janesville
Secretary	
ORINE, MARTIN C.	Janesville
§ Davis, Raymond D.	Waseca
§ Florine, Martin C.	Janesville
†§Gallagher, Bernard J.	Waseca
§ Hottinger, Raymond C.	Janesville
†§McIntire, Homer M.	Waseca
§ Normann, Stephen T.	Waseca
§ Oeljen, Siegfried C. G.	Waseca
§ Olds, George H.	New Richmond
§ Swenson, Orvie J.	Waseca

WASHINGTON COUNTY MEDICAL SOCIETY

Washington and Dakota Counties
Regular Meetings, second Tuesday in each month. Annual Meeting, December.
Number of Members—21

President	
JUST, HERMAN J.	Hastings
Secretary	
JUERGENS, MANLEY F.	Stillwater
§ Carlson, Russel E.	Stillwater
Fasbender, Herman T.	Hastings
†§Holcomb, Joel T.	Marine-on-St. Croix
† Hooper, Worth A.	Long Beach, Calif.
† Humphrey, Wade R.	Stillwater
§ Jenson, James E.	Stillwater
Josewski, Raymond J.	Stillwater
§ Juergens, Manley F.	Stillwater
Just, Herman J.	Hastings
Kiolhasa, Edward B.	Stillwater
Kulzer, Norbert J.	Hastings
§ McCarten, Francis M.	Stillwater
Mensheha, Nicholas.	Forest Lake
† Poirier, Joseph A.	Forest Lake
Ruggles, George M.	Forest Lake
§ Sherman, Carnot H.	Baypor
§ Stuhr, John W.	Stillwater
Torghele, John R.	Hastings
Van Meier, Henry	Stillwater
Weiss, Carl A.	Hasting
Wood, Lloyd T.	Forest Lak

WEST CENTRAL MINNESOTA MEDICAL SOCIETY

Big Stone, Pope, Stevens, and Traverse Counties
Regular Meetings, one Tuesday in March, May, September and November.
Annual Meeting, November.
Number of Members—26

President	
HEDEMARK, HOMER H.	Ortonville
Secretary	
KARN, JACOB F.	Ortonville
§ Arneson, Arthur I.	Morris
§ Behmler, Frederick Wm.	Morris
†§Bergan, Otto	Clinton
† Bolsta, Charles	Ortonville
§ Bucher, Foster D	Starbuck
†§Eberlin, Edward A.	Glenwood
§ Eide, O. A.	Hancock
† Elsey, James R.	Glenwood
*§Giesen, Allan F.	Starbuck
Good, Roy H.	Glenwood
Hedemark, Homer H.	Ortonville
Hedemark, Truman A.	Ortonville
Karn, Jacob F.	Ortonville
§ Kooda, Jennings C.	Morris
Lee, Gordon E.	Glenwood
‡ Letson, Robert D.	Glenwood
§ Lindberg, Alfred L.	Wheaton
†§Linde, Herman	Cyrus
§ Magnuson, Allen E.	Wheaton
§ Merrill, Robert W.	Morr
Muir, Walter F.	Browns Valle
§ Oliver, Irwin L.	Graceville
† Ransom, Matthias L.	Hancock
§ Rossberg, Raymond A.	Morr
§ Swedenburg, Paul A.	Glenwoo
§ Watson, Robert M.	Morri
Winge, H. C.	Wheaton

WINONA COUNTY MEDICAL SOCIETY

Winona County
Regular Meetings, first Monday in January, April, July and October.
Annual Meeting, first Monday in January.
Number of Members—29

President	
FINKELNBURG, WILLIAM O.	Winona
Secretary	
WILSON, LOUIS J.	Winona
§ Boardman, Dalmon V.	Winona
§ Christensen, Eli E.	Winona
§ Finkelnburg, William O.	Winona
§ Hartwich, Roger F.	Winona
§ Heise, Carl vR.	Winona
§ Heise, Paul vR.	Winona
§ Heise, Philip vR.	Winona
§ Hughes, Sidney O.	Winona
§ Johnston, Leonard F.	Winona
§ Keyes, John D.	Winona
§ Loomis, George L.	Winona
†§McLaughlin, Edmund M.	Winona
§ Mattison, Percy A.	Winona
§ Meinert, Albert E.	Winona
Neumann, Conrad A.	Winona
§ Page, Raymond L.	St. Charles
†§Robbins, Charles P.	Winona
§ Roemer, Henry J.	Winona
§ Rogers, Charles W.	Winona
§ Rollins, Pat	St. Charles
§ Satterlee, Howard W.	Lewiston
§ Schmidt, Hilmar R.	Gloversville, N. Y.
§ Tweedy, John A.	Winona
§ Tweedy, Robert B.	Winona
§ Vollmer, Frederick J.	Winona
§ Wilson, Louis J.	Winona
§ Wilson, Rolland H.	Winona
§ Woltjen, Myron J.	Rushford
§ Younger, Lewis I.	Winona

WRIGHT COUNTY MEDICAL SOCIETY

Wright County
Regular Meetings, first Tuesday of every second month.
Annual Meeting, first Tuesday in March.
Number of Members—17

President	
GUILFOILE, PIERRE J.	Delano
Secretary	
CATLIN, THEODORE J.	Buffalo
‡ Abullarade, Jose A.	New York, N. Y.
§ Anderson, Waldo P.	Buffalo
§ Bendix, Lester H.	Annandale
†§Catlin, John J.	Buffalo
§ Catlin, Theodore J.	Buffalo
§ Ellison, Frank E.	Monticello
‡ Fetzek, Albert D.	Great Falls, Montana
§ Greenfield, Wm. Theodore.	Cokato
Grundset, Ole J.	Montrose
§ Guilfoile, Pierre J.	Delano
§ Hall, William E.	Maple Lake
§ Hart, William E.	Monticello
Purves, G. Harland	Buffalo
§ Sandeen, Robert M.	Buffalo
§ Smorstok, Matthew B.	Monticello
§ Thielen, Robert D.	Saint Michael
§ Thomas, William H.	Howard Lake

Alphabetic Roster

Key to Symbols:

*Deceased; †Associate, Junior Associate, Residency, Affiliate or Life Member; ‡In Service

† Aanes, Almer M.	Red Wing
Aaro, Leonard A.	Rochester
Abraham, Arden L.	Duluth
Abramson, Milton	Minneapolis
‡ Abullarade, Jose A.	New York, N. Y.
Achor, Richard W. P.	Rochester
Adair, Albert F., Jr.	Rochester
Adams, Bertram S.	Hibbing
* Adams, R. Charles	Rochester
Addy, Edward R.	Gilbert
Adkins, Charles D.	Minneapolis
Adkins, Galen H.	Anoka
Affeldt, Daniel E.	Kasson
Aga, John H.	Rochester
Ahern, Eugene	Minneapolis
Ahlfs, Jacob J.	Caledonia
Ahola, Kenneth E.	Hibbing
† Ahrens, Albert E.	St. Paul
Ahrens, Curtis F.	Duluth
‡ Ahrens, Robert M.	St. Paul
*†Aitkens, Herbert B.	LeCenter
Akins, Willard M.	Red Wing
Albrecht, H. H.	Chisago City
Alcorn, William J.	Wahasso
† Alden, John F.	St. Paul
Alden, W. Charles	Kimball
Alexander, Harlan A.	Minneapolis
Alexander, John D., Jr.	Rochester
Aling, Charles A.	Minneapolis
Allen, Edgar V. N.	Rochester
Allen, George S.	Cannon Falls
Allen, John H.	Montevideo
‡ Allison, David D.	Duluth
Alpert, Abraham E.	Virginia
Althausen, Theodore L.	Minneapolis
† Altnow, Hugo O.	Coral Gables, Fla.
Alton, Donald G.	Bird Island
Amatuzio, Donald S.	Minneapolis
† Amberg, Samuel	Rochester
‡ Ambrus, Laszlo	New York, New York
Amerongen, W. W.	St. Paul
Andersen, Howard A.	Rochester
Andersen, Silas C.	Minneapolis
Anderson, Arnold S.	St. Louis Park
Anderson, Chester A.	Hector
Anderson, Chester A.	Madison
Anderson, David M.	Minneapolis
Anderson, David P.	Austin
† Anderson, Edward D.	Minneapolis
Anderson, Ernest M.	St. Cloud
Anderson, Frank J.	Minneapolis
Anderson, Franklin C.	Owatonna
Anderson, Harold J.	Austin
Anderson, James J.	Mankato
Anderson, John T.	Minneapolis
Anderson, John W.	Blue Earth
Anderson, Karl W.	Minneapolis
Anderson, Margaret C.	Mankato
Anderson, Mark J.	Rochester
Anderson, Markham J., Jr.	Rochester
Anderson, Milton W.	Rochester
Anderson, Richard E.	Willmar
Anderson, Roger L.	Minneapolis
Anderson, U. Schuyler	Minneapolis
Anderson, Waldo P.	Buffalo
Anderson, Wallace F.	Minneapolis
Anderson, Wallace E.	Clearbrook
Anderson, Wallace R.	Austin
Anderson, Werner W.	Brainerd
Anderson, William H.	Minneapolis
Anderson, William T.	Minneapolis
Andreassen, Einar C.	St. Paul
Andreassen, Rolf L.	Minneapolis
Andresen, Karl D'A.	Minneapolis
Andrew, William F.	Duluth
Andrews, Bernice F.	Holdingford
Andrews, Robert S.	Minneapolis
Andrews, Roy N.	Mankato
Ankner, Frank J.	Minneapolis
Antonow, Arthur M.	Virginia
Arends, Archabald L.	Minneapolis
Arey, S. Lane	Minneapolis
Arhelger, Stuart	Minneapolis
Arko, Joseph L.	Hibbing
Arlander, Clarence E.	Minneapolis
Arling, Leonard S.	Minneapolis
Arms, James J.	Minneapolis
Armstrong, Ralph S.	Winnebago
Arndt, Harry Wm.	Detroit Lakes
Arnesen, John F.	Owatonna
Arneson, Arthur I.	Morris
Arnold, Anna W.	Minneapolis
Arnold, Elmer Wm.	Adrian
Arnquist, Andrew S.	St. Paul
Arny, Frederick P.	Minneapolis
Arvidson, Carl G.	Minneapolis
Arzt, Philip K.	St. Paul
Asta, Joseph J.	Duluth
Athens, Alvin G.	Duluth
Atmore, William G.	Rochester
Aufderheide, Arthur C.	Duluth
Aulick, Ernest J.	Belgrade
† Aune, Martin	Minneapolis
*†Aurand, William H.	Minneapolis
Aurelius, J. Richards	St. Paul
Ausman, Duane R.	St. Paul
† Austrian, Sol	St. Paul
Autrey, William A.	St.Cloud
‡ Baars, Conrad W.	Camp Cook, Calif.
Babb, Frank S.	St. Paul
Backus, Reno W.	Nopeming
Bacon, Donald K.	St. Paul
Badeaux, George I.	Brainerd
Bader, J. L.	Slayton
Baer, Walter	St. Paul
Baggenstoss, Archie H.	Rochester
Baggenstoss, Osmond J.	Minneapolis
Bagley, Charles M.	Duluth
Bagley, Elizabeth C.	Duluth
Bagley, Russell W.	Minneapolis
Bagley, William R.	Duluth
Bahn, Robert C.	Rochester
Baich, Velemir M.	Coleraine
Bain, Robert C.	Rochester
Bair, Hugo L.	Rochester
Baird, Joseph W.	Minneapolis
Baird, Raymond L.	Lake Crystal
Baken, Melvin P.	Minneapolis
Baker, Abe B.	Minneapolis
Baker, Alfred T.	Minneapolis
Baker, George S.	Rochester
† Baker, Harry R.	Hayfield
Baker, Hillier L., Jr.	Rochester
Baker, Jeannette L.	Fergus Falls
Baker, Milton E.	Minneapolis
Baker, Norman H.	Fergus Falls
Bakkila, Henry E.	Duluth
Balcome, Milton M.	St. Paul
Baleisis, Peter	Minneapolis
† Balfour, Donald C.	Rochester
Balfour, William M.	Rochester
Balkin, Samuel G.	Minneapolis
Balogh, Charles J.	Minneapolis
Bank, Harry E.	San Francisco, Calif.
Banner, Edward A.	Rochester
Barber, Tracy E.	Austin
Bardon, Richard	Duluth
Bargen, J. Arnold	Rochester
Barker, John D.	Duluth
Barker, Nelson W.	Rochester
Barnes, Arlie R.	Rochester
Barnes, Richard E.	Aurora
Barnett, Joseph M.	St. Paul
† Barney, Leon A.	Duluth
Barno, Alex	St. Louis Park
‡ Baronofsky, Ivan D.	St. Paul
Barr, James S.	Elmore
Barr, Lowell C.	Albert Lea
Barr, Maxwell M.	Minneapolis
Barr, Robert N.	Minneapolis
Barr, Ronald W.	Montevideo
Barrett, Earl E.	Duluth
Barron, Jesse J.	Minneapolis
† Barron, Moses	Minneapolis
‡ Barron, S. Steven	Minneapolis
Barry, Maurice J., Jr.	Rochester
† Barsness, Nellie O. N.	St. Paul
Bartholomew, Lloyd G.	Rochester
Bartzen, Peter J.	Duluth
Basinger, Harold P.	Windom
Basinger, Harvey R.	Mountain Lake
Basinger, Homer P.	Windom
Bastron, James A.	Rochester
Batdorf, B. Niles	Mankato
Bauer, Eugene L.	St. Paul
Bauer, Paul G.	Faribault
Baumgartner, Florian H.	Albany
*†Baxter, Stephen H.	Minneapolis
Bayley, E. Covell	Lake City
Bayrd, Edwin D.	Rochester
Beach, Northrop	Minneapolis
Beahrs, Oliver H.	Rochester
† Beals, Hugh	La Jolla, Calif.
Beaton, J. Gordon	Northfield
Beck, Charles J.	No. St. Paul
† Becker, Arnetta M.	Lincoln, Nebr.
Becker, Frederick T.	Duluth
Beckering, Gerrit	Edgerton
Beckett, Victoria Ling	Detroit, Mich.
Bedford, Edgar Wm.	Minneapolis
Beech, Raymond H.	St. Paul
Beek, Harvey O.	St. Paul
Beer, John J.	St. Paul
Behmler, Frederick Wm.	Morris
Behling, Frederick L.	Rochester
Behr, Orlo K.	Crookston
Beirstein, Samuel	Minneapolis
Beiswanger, Richard H.	Minneapolis
Bell, Charles C.	St. Paul
† Bell, E. T.	Minneapolis
Bellomo, James	St. Paul
Bellville, Titus P.	Minneapolis
Belzer, Meyer S.	Minneapolis
Bender, James H.	Brainerd
Bendix, Lester H.	Annandale
† Benedict, William L.	Rochester
Benell, Otto E.	Virginia
Benepe, James L.	St. Paul
Benesh, Louis A.	Minneapolis
Benjamin, Edwin G.	Minneapolis
Benjamin, Harold G.	Minneapolis
Benjamin, Walter G.	Pipestone
Bennett, Warren A.	Rochester
*†Bennion, P. H.	Isway, Mont.
Benson, Alfred H.	Little Falls
Benthack, Elaine M.	St. Paul
Bentley, Norman P.	St. Paul
Bepko, Marie K.	Cloquet
Berdez, George L.	Duluth
Berg, Arnold M.	Roseau
Berg, Clinton C.	Wayzata
† Bergan, Otto	Clinton
Bergan, R. O.	Duluth
Berge, David O.	Roseau
Berge, Harry L.	Mora
Berge, Kenneth G.	Rochester
Berger, Alex G.	Minneapolis
Bergh, George S.	Minneapolis
Bergh, Solveig M.	Minneapolis
Berglund, Eldon B.	Minneapolis
Bergman, Oscar B.	St. James
Bergquist, James R.	Minneapolis
† Berkman, David M.	Oronoco
Berkwitz, Nathaniel J.	Minneapolis
Berlin, Anthony S.	Hallock
Berman, Reuben	Minneapolis
Bernatz Philip E.	Rochester
Bernier, M. J.	No. St. Paul
Bernstein, Irving C.	Minneapolis
Bernstein, William C.	St. Paul
Bessesen, Alfred N., Jr.	Minneapolis
Bessesen, Daniel H.	Olivia
Beuning, John B.	St. Cloud
‡ Beyer, Eugene F.	San Francisco, Calif.
Bianco, Anthony J.	Duluth
† Bianco, Anthony J., Jr.	Rochester
Bicek, Joseph F.	St. Paul
Bickel, William H.	Rochester
† Biedermann, Jacob	Thief River Falls
Bieter, Raymond N.	Minneapolis
† Bigelow, Charles E.	Dodge Center
Bigler, Earl E.	Perham
Bigler, Ivan E.	Perham
Bilka, Paul J.	Minneapolis
Billings, Ralph E.	Franklin
Binder, Manuel R.	Minneapolis
† Binet, Henry E.	Grand Rapids
† Binger, Henry E.	Phoenix, Ariz.
† Birkhead, Newton C.	Rochester
Black, B. Marden	Rochester
Black, Earl J.	St. Paul
Black, William A.	New Ulm
Blackburn, Charles M.	Rochester
Blackmore, Sidney C.	Biwabik
Blake, Allen J.	Hopkins
Blake, James A.	Hopkins
Blake, Paul S.	Hopkins
† Blakey, Adam R.	Osakis
Bloedel, Traugott J.	Osseo
Blomberg, Robert D.	Minneapolis
Blomberg, William R.	St. Paul
Bloom, Joseph	Silver Bay
Bloom, Norman B.	Minneapolis

Blumberg, Henry B..........Fairmont
Blumentbal, Jacob S..........Minneapolis
Boardman, Dalmon V..........Winona
† Bock, Ronald A..........St. Paul
Bodaski, Albert A..........Tyler
*†Boeckmann, Egil ....St. Paul
Boehrer, John J..........Minneapolis
Bofenkamp, Benjamin ....Minneapolis
Bofenkamp, F. William..........Luverne
Bohn, Donald G..........Minneapolis
Boies, Lawrence R..........Minneapolis
Bolender, Harold L..........St. Paul
Boline, Clifford A..........Battle Lake
† Bolsta, Charles ....Ortonville
Bolstad, Owen C..........Little Falls
Bolz, J. Arnold..........Grand Rapids
Boman, Paul G..........Duluth
Bonello, Frank J..........St. Paul
Bonner, John L..........Eveleth
‡ Bonnet, John D..........Clovis, New Mexico
Boody, George J., Jr..........Sandstone
Boone, Ervin S..........Luverne
† Booth, Albert E..........Minneapolis
† Boreen, Clifton A..........Minneapolis
Borg, Joseph F..........St. Paul
Borgerson, Arthur H..........Long Prairie
† Borgerson, Egbert J..........St. Paul
Borman, Chauncey N..........Minneapolis
Borowicz, Leonard A..........Minneapolis
Bosland, Howard G..........Willmar
Bossard, John W..........Rochester
† Bossert, Clarence S..........Mora
‡ Boswell, J. Thornton..........Kenosha, Wisc.
Botham, Richard J..........Rochester
Bottolfson, Bottolf T..........Moorhead
Bouchelle, McLemore ....Virginia
† Bouma, Lewis R..........St. Paul
Bouquet, Bertram J..........Wabasha
Bouthilet, Florence J..........St. Paul
Bowen, Robert L..........Hibbing
Bowers, Dorrance ....Rochester
Bowers, Gordon G..........Minneapolis
Bowers, Robert N..........Lake City
Boyd, David A., Jr..........Rochester
‡ Boyd, George K..........Pittsburgh, Pa.
† Boyea, Lyle H..........Babbitt
Boyer, George S..........Crookston
*†Boyer, Samuel H., Sr..........Duluth
Boyer, Samuel H., Jr..........Duluth
Boynton, Ruth E..........Minneapolis
Boysen, Herbert ....Madelia
Boysen, Peter ....Bemidji
‡ Bozanich, Milosh S..........Rochester
Braasch, John W..........Rochester
† Braasch, William F..........Rochester
Bradley, Nelson J..........Willmar
Brand, George D..........St. Paul
† Brand, William A..........Redwood Falls
Brandenburg, Robert O..........Rochester
† Branham, Donald S..........Deer Park, Wisc.
Bratholdt, James W..........Watertown
Bratrud, Arthur F..........Minneapolis
† Bratrud, Edward..........Thief River Falls
Bratrud, Theodore E..........Minneapolis
Bratrude, Earl J..........St. James
Braun, Robert A..........Rochester
Braun, Ohrmundt C..........Grand Rapids
† Bray, Elwyn R..........St. Paul
Bray, Philip N..........Duluth
Breitenhucher, Robert B..........Minneapolis
Brekke, Harvey J..........Minneapolis
Bretzke, Carl O..........Hutchinson
Bridge, Allyn G..........Minneapolis
Bridge, Ezra V..........Cannon Falls
Briggs, John F..........St. Paul
*†Brigham, Charles F., Sr..........St. Cloud
Brigham, Charles F., Jr..........St. Cloud
Brill, Alice K..........Minneapolis
Brink, Adlai A..........Baudette
Brink, Donald M..........Hutchinson
Broadbent, James C..........Rochester
Broadie, Thomas E..........St. Paul
Brockway, Roger W..........Grand Rapids
Broders, C. W..........Rochester
Brodie, Walter D..........St. Paul
Broker, Henry M..........St. Cloud
Brooker, Warren J..........Duluth
† Brooks, Charles N..........Minneapolis
Brown, Alexander E..........Rochester
† Brown, Alexander H..........Pipestone
Brown, Edgar D..........St. Petersburg, Fla.
‡ Brown, Hector M..........Walker
Brown, Henry A..........Rochester
Brown, Ian A..........Minneapolis
Brown, Joe R..........Rochester
† Brown, John C..........Los Gatos, Calif.
Brown, Philip W..........Rochester
Brown, Roland G..........Rochester
Brown, William D..........Minneapolis
Bruhl, Heinz H..........Faribault
Bruntsing, Louis A..........Rochester
Brusegard, James F..........Red Wing
Bruwer, Andre J..........Rochester

‡ Buchanan, Gerald S..........Deer River
Bucber, Foster D..........Starbuck
Buchstein, Harold F..........Minneapolis
† Buck, Frederick H..........Shakopee
Buckley, J. J..........St. Paul
Buckley, Robert P..........Duluth
Buesgens, Ralph H..........Waterville
Buie, Louis A..........Rochester
Buirge, Raymond E..........Minneapolis
Bulinski, Theodore J..........St. Paul
Bulkley, Kenneth ....Minneapolis
Bunker, Bevan W..........Anoka
Burch, Edward P., II..........St. Paul
† Burch, Frank E..........St. Paul
Burchell, Howard B..........Rochester
‡ Buresh, Kenneth L..........Columbus, Ga.
Burgerman, Arthur..........Rochester
Burich, Harry F..........Rochester
Burke, Edmond C..........Rochester
Burklund, Edwin C..........St. Paul
Burleigh, Edward G..........Eveleth
Burlingame, David A..........St. Paul
Burmeister, Richard O..........St. Paul
Burnett, Joseph W..........New Ulm
Burnham, Wesley H..........Minneapolis
Burns, Catherine ....Albert Lea
Burns, Floyd M..........Milan
Burns, M. Alpheus..........Milan
† Burns, Robert M..........St. Paul
Burroughs, John Townsend..........Rochester
Burseth, Edgar C..........Mora
Burton, Carl G..........St. Paul
Buscher, Julius C..........St. Cloud
‡ Bush, Robert P..........Ft. Benning, Ga.
Bushard, Wilfred J..........Minneapolis
Busher, Herbert H..........St. Paul
Butler, John K..........Cloquet
Butt, Hugh R..........Rochester
Butturff, Carl R..........Freeborn
Butzer, John A..........Mankato
Butzer, John F..........Mankato
Buzzelle, Leonard K..........Minneapolis

Cable, Morris L..........Minneapolis
Cabot, Clyde M..........Minneapolis
Cady, Laurence H..........Minneapolis
Cain, Clark L..........St. Paul
Cain, James C..........Rochester
Cain, James H..........Hoffman
Cairns, Robert J..........Redwood Falls
† Calhoun, F. W..........Albert Lea
Calin, Stanford H..........St. Paul
Callahan, John A..........Rochester
Callahan, Francis F..........St. Paul
Calvert, Wilson C..........Rochester
Cameron, Dale C..........St. Paul
Cameron, Isabell L..........Minneapolis
Cameron, John H..........Crookston
Camp, Ray Junior..........Madison
Campbell, Donald C..........Rochester
Campbell, Lowell M..........Minneapolis
Campbell, Orwood J..........Minneapolis
Canfield, Wayne W..........St. Peter
Canine, James L..........So. St. Paul
Cantrell, Glenn ....Rochester
Cantwell, William F..........International Falls
Caplan, Leslie ....Minneapolis
Card, William H..........Minneapolis
Cardle, George E..........Brainerd
Carey, James B..........Minneapolis
Carlander, Lester W..........Minneapolis
Carley, Walter A..........St. Paul
Carlon, Donald L..........Rochester
Carlson, Carl E..........Alexandria
Carlson, Charles V..........Mound
Carlson, John V..........Westbrook
Carlson, Lawrence ....Minneapolis
Carlson, Leonard T..........Minneapolis
Carlson, Russel E..........Stillwater
Carlson, Vernon J..........Moorhead
Caron, Robert P..........Minneapolis
Carr, David T..........Rochester
Carr, William J..........Minneapolis
Carroll, John J..........Winsted
Carryer, Haddon McC..........Rochester
Carthey, Frank J..........New Ulm
Caspers, Carl G..........Minneapolis
† Catlin, John J..........Buffalo
Catlin, Theodore J..........Buffalo
† Cavanor, Frank T..........Minneapolis
Cedarleaf, Cherry B..........Mahtomedi
Ceder, Elmer T..........Minneapolis
Ceplecha, Stanley F..........Redwood Falls
Cervenka, Charles F..........New Prague
‡ Cesnik, Robert J..........St. Cloud
Chadbourn, Charles R..........St. Paul
Chadbourn, Wayne A..........St. Cloud
Chalgren, William S..........Mankato
Challman, S. Alan..........Minneapolis
† Chambers, Winslow C..........Blue Earth
Chatterton, Carl C..........St. Paul
Chavez, Demetrio A..........Minneapolis

Chermak, Francis G..........International
Chesler, Merrill D..........Minnea
*†Chesley, Albert J..........Minnea
Child, Sherman B..........Minnea
Childs, Donald S., Jr..........Roche
Chisholm, Tague C..........Minnea
Chittum, John R..........Au
Christensen, Clarence H..........Du
Christensen, Eli E..........Wi
† Christensen, Mentor ....St.
Christensen, Norman A..........Roche
† Christensen, Philip D..........St.
Christiansen, Andrew ....St.
Christiansen, Harold A..........Jac
Christianson, Bruce W..........Roche
Christoferson, Kent W..........Roche
Chunn, Stanley S..........Wil
Ciriacy, Edward W..........
Clagett, O. Theron..........Roche
Clapp, Hubert D..........Crook
Clark, Clarence L..........Du
Clark, Edward C..........Roche
Clark, Elizabeth A..........Du
Clark, Harry B..........St. Cl
Clark, Henry B., Jr..........Minnea
Clark, Ivan T..........Du
Clark, Leslie Wm..........Spring Va
Clark, Malcolm D..........Minnea
Clarke, John W..........Waterto
Clay, Lyman B..........Minnea
Claydon, Howard F..........Red W
Cleaves, William D..........Sauk Ce
† Clement, John B..........Lester Pra
Clifford, George W..........Alexan
Clifton, Theodore A..........Chatf
Closuit, Frederick C..........Ai
Cochrane, Byron B..........St.
Cochrane, Ray F..........Minneap
Coddon, Walter D..........St.
Coe, John I..........Minneap
Cohen, Bernard A..........Minneap
Cohen, Ellis N..........Minneap
Cohen, Ephraim B..........Minneap
Cohen, Maynard M..........St. P
Cohen, Sumner S..........Oak Ter
Colby, M. Y., Jr..........Roche
Colby, Woodard L..........St. P
Cole, James S..........Minneap
Cole, Wallace H..........St. P
Coleman, John B..........St. P
Coll, James J..........Dul
† Collie, Henry G..........St. Peterburg,
† Collins, Arthur N..........Dul
Collins, Joseph S..........Waba
Combacker, Leon C..........Fergus F
Comfort, Mandred W..........Roches
Compton, Russell F..........Roches
* Condit, William H..........Minneap
Conley, Francis W..........Dul
Conley, Robert H..........Mank
Connolly, Coleman J..........St. P
Connolly, Daniel C..........Roches
† Connolly, Joseph P..........So. St. P
Connor, Charles E..........St. P
Cook, C. Kenneth..........St. P
Cook, Edward N..........Roches
Cook, Jay M..........Stap
Cook, Roderick W., Jr..........Roches
Cooley, Jack C..........Roches
Coombs, Carl H..........Cass La
Cooper, Charles C..........St. P
† Cooper, Maurice D..........Winneba
Cooper, Robert R..........Minneapo
Cooper, Talbert ....Roches
† Cope, Hershel B..........Minneapo
Corbin, Kendall B..........Roches
Corniea, Albert D..........Minneapo
‡ Correa, Dale H..........Minneapo
Corrigan, Cyril J..........Minneapo
‡ Coseriu, Vasile G..........St. P
Cosgriff, James A., Sr..........Oli
Cosgriff, James A., Jr..........Oli
Cottone, Francis John..........Roches
Coulter, Harold E..........Made
Countryman, Roger S..........St. P
Coventry, Markham B..........Roches
Coventry, William D..........Dul
Covey, Kenneth W..........Roches
Cowan, Donald W..........Minneapo
Cowan, George M..........Dulu
Craig, Clair C..........International Fa
Craig, David M..........St. P
Craig, M. Elizabeth ....Minneapo
‡ Craig, Richard M..........Dayton, O
Craig, Winchell McK..........Roches
Cranmer, Richard R..........Minneapo
Cranston, Robert W..........Minneapo
Creevy, Charles D..........Minneapo
* Creighton, Ralph H..........Minneapo
Critchfield, Lyman R..........St. Pa
Cronwell, Bernhard J..........Aus
Crowley, James H..........St. Pa
Crudo, Vincent D..........St. Pa
Crumbley, James J., Jr..........Tampa, F

Crump, James W. .... St. Paul
Culligan, John M. .... St. Paul
Culligan, Leo C. .... Minneapolis
Culp, Ormond S. .... Rochester
Culver, L. G. .... St. Paul
Cundy, Donald T. .... Minneapolis
Curtis, Rauen A. .... LeCenter
Cushing, Robert L. .... Brainerd
Cutts, George .... Minneapolis

Dady, Elmer E. .... Minneapolis
Daehlin, Rolf .... Fairchild, Washington
Daggett, Donald R. .... Minneapolis
Dahl, Elmer O. .... Minneapolis
Dahl, James C. .... Minneapolis
Dahl, John A. .... Minneapolis
Dahlin, David C. .... Rochester
Daignault, Oscar .... Benson
Dale, Lester N. .... Red Lake Falls
Daly, David .... Rochester
Daniel, Donald H. .... Minneapolis
Danielson, Karl A. .... Litchfield
Danielson, Lennox .... Litchfield
Danyluk, Michael .... Minneapolis
Daugherty, Guy W. .... Rochester
David, Reuben .... Minneapolis
Davis, Austin C. .... Rochester
Davis, Edward V. .... St. Paul
Davis, George D. .... Rochester
Davis, Jay C. .... Minneapolis
Davis, Lloyd T. .... Wadena
Davis, Luther F. .... Wadena
Davis, Raymond D. .... Waseca
Davis, William I. .... Mound
Dawson, James R. .... St. Paul
Dawson, Lorin D. .... Worthington
Dearing, William H. .... Rochester
Decker, Barry .... Rochester
Decker, Charles H. .... St. Paul
Decker, David G. .... Rochester
DeGeest, James H. .... Goodhue
DeKruif, Hendrik .... Fergus Falls
Delmore, John L., Sr. .... Roseau
Delmore, John L., Jr. .... Roseau
Delmore, Robert J. .... New Orleans, La.
del Plaine, Carlos W. .... Minneapolis
Demo, Robert A. .... Albert Lea
Derauf, Benjamin I. .... St. Paul
Deters, Donald C. .... St. Paul
Detjen, Edward D. .... Bigfork
Devereaux, Thomas J. .... Wayzata
Devine, Kenneth D. .... Rochester
DeWeerd, James H. .... Rochester
Deweese, Wilford J. .... Bemidji
Dewey, Donald H. .... Owatonna
Dickinson, L. S. .... Rochester
Dickman, Rov W. .... Monterey, Calif.
Dickson, Franklin H. .... Proctor
Dickson, Thomas H. .... St. Paul
Diefenhach, Eugene J., Jr. .... Minneapolis
Diehl, Harold S. .... Minneapolis
Dierker, Heinrich .... Minneapolis
Diessner, Ardell W. .... Redwood Falls
Diessner, Grant R. .... Rochester
Diessner, Henry D. .... Minneapolis
Dille, Donald E. .... Igloo, S. D.
Dines, David E. .... Rochester
Dixon, Claude F. .... Rochester
Dobson, M. W. .... Mankato
Dockerty, Malcolm B. .... Rochester
Dodds, William Clark .... Detroit Lakes
Dodge, Henry W., Jr. .... Rochester
Doherty, Elmer M. .... New Prague
Dokken, James H. .... Windom
Doman, Victor Wm. .... Lakefield
Doms, Vernon A. .... Elhow Lake
Donaldson, Charles S. .... St. Cloud
Donatelle, Edward P. .... Minneapolis
Donoghue, Francis E. .... Rochester
Donovan, Daniel L. .... Albert Lea
Dordal, John .... Sacred Heart
Dorge, Richard I. .... Minneapolis
Dornblaser, Harry B. .... Los Gatos, Calif.
Dorsey, George C. .... Minneapolis
Douglas, Kenneth W. .... Sandstone
Douglass, Bruce E. .... Rochester
Dovenmuehle, Robert H. .... Durham, N. C.
Downing, William C. .... Crookston
† Doxey, Gilbert L. .... Minneapolis
Doxsee, George C. .... Chisholm
Doyle, James R. .... Rochester
Doyle, Lawrence O. .... Minneapolis
rake, Carl B. .... St. Paul
rake, Charles R. .... Minneapolis
† redge, Homer P. .... Sandstone
redge, Thomas H. .... St. Cloud
rexler, George W. .... Blue Earth
rill, Herman E. .... Hopkins
rips, Della G. .... Oronoco
ry, Thomas J. .... Rochester
ubbe, Frederick H. .... New Ulm

† DuBois, Julian F., Sr. .... Sauk Centre
DuBois, Julian F., Jr. .... Sauk Centre
Duff, Edwin R. .... Minneapolis
Dummer, Donald J. .... Minneapolis
Duncan, James W. .... Moorhead
† Dungay, Neil S. .... Northfield
Dunlap, Earl H. .... Minneapolis
Dunn, Jack, Jr. .... Clovis, New Mexico
Dunn, James N. .... St. Paul
Dunn, Robert C. .... St. Paul
Dupont, Joseph A. .... Excelsior
Duryea, Marbry .... Minneapolis
Duryea, Willis M. .... Minneapolis
Duryea, Willis M., Jr. .... Minneapolis
DuShane, James W. .... Rochester
*† Dutton, C. E. .... Minneapolis
Dvorak, Benjamin A. .... Minneapolis
Dwan, Paul F. .... Minneapolis
Dworsky, Samuel D. .... Minneapolis
Dwyer, John J. .... Duluth
Dyer, John Allen .... Rochester
Dysterheft, Adolf F. .... Gaylord

Earl, George A. .... St. Paul
Earl, John R. .... St. Paul
Eaton, Lealdes M. .... Rochester
Eberly, Tobe S. .... Benson
† Eberlin, Edward A. .... Glenwood
Eckdale, John E. .... Marshall
Eckman, Philip F. .... Duluth
Eckman, Ralph J. .... Duluth
Edelmann, Robert B. .... Rochester
Eder, Walter P. .... Minneapolis
Edwards, Jesse E. .... Rochester
Edwards, Joseph W. .... St. Paul
Edwards, Lloyd G. .... St. Paul
Edwards, Thomas J. .... St. Paul
Egge, Sanford G. .... Albert Lea
Eginton, Charles T. .... St. Paul
Ehrenberg, Claude J. .... Minneapolis
Ehrlich, S. Paul .... Minneapolis
Eich, Matthew A. .... Minneapolis
Eichhorn, Edmund, P., Jr. .... Minneapolis
Eide, O. A. .... Hancock
Eiler, John .... Park Rapids
Eisenman, Walter .... Hibhing
Eisenstadt, David H. .... Minneapolis
Eisenstadt, William S. .... Minneapolis
Eitel, George D. .... Minneapolis
† Ekblad, John W. .... Duluth
Eklund, Carl D. .... Duluth
Ekstrand, LeRoy M. .... Wabasha
Eli, Earl W. .... Minneapolis
Elias, Frank J. .... Duluth
Elkins, Earl C. .... Rochester
Ellertson, Leonard M. .... Alhert Lea
Ellinger, Albert J. .... Willmar
Elliot, Harold J. .... Havfield
Ellis, Earl Wm. .... Elgin
Ellis, F. Henry .... Rochester
Ellison, David E. .... Minneapolis
Ellison, Ellis .... Minneapolis
Ellison, Frank B. .... Monticello
Elrod, Calvin R. .... Long Lake
† Elsey, James R. .... Glenwood
Elstner, Howard L. .... Rochester
† Ely, Orriman S. .... So. St. Paul
Emanuel, Karl Wm. .... Duluth
Emerson, Edward C. .... St. Paul
Emerson, Edwin E. .... Osakis
Emmett, John L. .... Rochester
Emmons, R. W. .... St. Paul
Emond, Albert J. .... Farmington
Emond, Joseph S. .... Farmington
Endress, Edward K. .... St. Paul
Engberg, Edward J. .... Faribault
Engel, Joseph P. .... Minneapolis
Engelhart, Peter C. .... Minneapolis
Englund, Elvin F. .... Minneapolis
Engstrand, Oscar J. .... Minneapolis
Engstrom, Denton P. .... Minneapolis
Engstrom, Robert .... Mankato
Enroth, Oscar E. .... St. Paul
Ensrud, Earl Richard .... Rochester
Eppard, Raymond M. .... Cloquet
Epstein, John H. .... Rochester
Erdal, Ove A. .... Albert Lea
Erich, John B. .... Rochester
Erickson, Alvin O. .... Long Prairie
Erickson, Clifford O. .... Minneapolis
Erickson, Donald J. .... Rochester
Erickson, Eskil .... Halstad
Erickson, George P. .... Hibbing
Erickson, Laurence F. .... Minneapolis
Erickson, Myron E. .... Minneapolis
Erickson, Reuben F. .... Minneapolis
Erickson, Vernon D. .... Grand Rapids
• Ericson, Reinhold M. .... Wayzata
† Ericson, Swan .... Los Angeles, Calif.
† Ernest, George C. H. .... St. Petersburg, Fla.
Ersfeld, Murray P. .... St.Paul

Erskine, Gordon M. .... Grand Rapids
† Ertel, Edward Q. .... Ellendale
Esensten, Sidney .... Minneapolis
† Eshelby, E. C. .... St. Paul
‡ Esser, Robert A. .... St. Charles, Ill.
Estes, J. Earle .... Rochester
Estrem, Ralph L. .... Fergus Falls
Estrem, Robert D. .... Fergus Falls
† Eusterman, George B. .... Rochester
Eustermann, John J. .... Mankato
Evans, Edward T. .... Minneapolis
† Evans, Harold W. .... Rochester
Evans, Leslie .... Sank Rapids
Evans, Robert D. .... Minneapolis
† Evarts, Arrah B. .... Rochester
Evensta, John B. .... Grand Rapids
Ewen, Edgar F. .... Rochester

Faber, John E. .... Rochester
Fabi, Mario Nestor .... Rochester
† Fahr, George E. .... Minneapolis
† Failor, Harlan J. .... Rochester
Fallon, Virgil T. .... Dawson
Falls, John L. .... Red Wing
Fansler, Walter A. .... Minneapolis
Farkas, John V. .... St. Paul
Farley, Frank G. .... Hibbing
Fasbender, Herman T. .... Hastings
Faucett, Robert L. .... Rochester
Faulconer, Albert, Jr. .... Rochester
Fawcett, Arthur M. .... Renville
Fawcett, Keith R. .... Duluth
Fedor, Robert D. .... Litchfield
Fee, John G. .... St. Paul
Feeney, John M. .... Minneapolis
Feigal, David W. .... Wayzata
Feigal, William M. .... Thief River Falls
Feinberg, Milton .... St. Paul
Feinberg, Philip .... Minneapolis
Feinberg, Samuel B. .... Minneapolis
Feinstein, Julius Y. .... Minneapolis
Felder, Davitt A. .... St. Paul
Feldmann, Floyd M. .... New York, N. Y.
Felion, Arthur J. .... St. Paul
Fellows, Manley F. .... Duluth
Fenger, Ejvind P. K. .... Oak Terrace
Ferguson, William C. .... Walnut Grove
Ferrand, Paula T. .... Moose Lake
Ferrell, Clarence R. .... Grand Rapids
Ferris, Deward O. .... Rochester
Fesenmaier, Otto B. .... New Ulm
Fesler, Harold H. .... St. Paul
‡ Fetzek, Albert D. .... Great Falls, Mont.
Feuling, John C. .... Duluth
Fidelman, Norman E. .... Foley
Field, Anthony H. .... Farmington
Field, Charles W. .... Minneapolis
Fifer, William R. .... St. Paul
Fifield, Malcolm M. .... Duluth
Figi, Frederick A. .... Rochester
Fingerman, David L. .... Minneapolis
Fink, Daniel L. .... St. Paul
Fink, Leo W. .... Minneapolis
Fink, Walter H. .... Minneapolis
Finkelnburg, William O. .... Winona
Fisch, Herbert M. .... Austin
Fischer, John R. .... Blooming Prairie
Fischer, Marion McC. .... Duluth
Fischer, Robert F. .... St. Paul
Fisher, Dan W. .... St. Paul
Fisher, Isadore I. .... Minneapolis
Fisketti, Henry .... Duluth
† Fitzgerald, Don F. .... Wayzata
Fitzsimons, William E. .... Brainerd
§ Fielstad, Christian A. .... Minneapolis
Flanagan, Harold F. .... St. Paul
Flanagan, Leonard G. .... Austin
Flancher, Leon H. .... Crookston
Flannery, Hubert F. .... St. Paul
Flatt, John R. .... Wabasha
Fleeson, William H. .... Minneapolis
*† Fleming, Aloysius .... Madison, N. J.
Fleming, Dean S. .... Hopkins
† Fleming, Thomas N. .... St. Cloud
Flesche, Bernard A. .... Lake City
Fliehr, Richard R. .... Minneapolis
Flink, Edmund B. .... Minneapolis
Flinn, James B. .... Redwood Falls
† Flinn, Thomas B. .... Remer
Floersch, Adrian J. .... Glencoe
Flom, Reynold P. .... St. Paul
‡ Flom, Robert S. .... Columbus, Ga.
Flor, Frank S. .... Rochester
Florine, Martin C. .... Janesville
Flynn, Bernard F. .... Hibbing
Flynn, L. L., Jr. .... St. Paul
† Fogarty, Charles W., Sr. .... St. Paul
Fogarty, Charles W., Jr. .... St. Paul
Fogelberg, Emil J. .... St. Paul
Foker, Leslie W. .... Minneapolis
Foley, Frederic E. B. .... St. Paul
Folken, Frank G. .... Albert Lea

Folsom, Louis B. ....Minneapolis
Ford, Burton C. ....Marshall
Ford, William H. ....Minneapolis
Forsythe, James R. ....St. Paul
Fortier, George M. A. ....Little Falls
Fortier, Rene G. ....Mankato
Foss, Edward L. ....Rochester
Foster, Orley W. ....Minneapolis
Foulk, William T., Jr. ....Rochester
Fowler, Lucius Haynes ....Minneapolis
† Fox, Donald P. .....Tanganyika, East Africa
Fox, James Rogers ....Minneapolis
Fox, LeRoy J. ....St. Paul
† Franchere, Frederick Wm. .....Lake Crystal
Francis, David W. ....Morristown
Frane, Donald B. ....Minneapolis
Franklin, Gordon W. ....Northome
Fredericks, George M. ....Minneapolis
Frederickson, Alice G. ....Willmar
Fredricks, Merriam G. ....Duluth
Freeman, Charles D., Jr. ....St. Paul
Freeman, Craig ....Minneapolis
Freeman, Donald W. ....St. Louis Park
Freeman, Gerald I. ....St. Paul
† Freeman, John P. ....Glenville
Freidman, Louis L. ....St. Paul
French, Bayard T. ....Hibbing
French, Lyle A. ....Minneapolis
Frethem, Allen A. ....Rochester
Frey, Richard J. ....Minneapolis
Friberg, Joseph ....Minneapolis
Fricke, Robert E. ....Rochester
Fried, Louis A. ....Minneapolis
Friedell, Aaron ....Minneapolis
Friedell, George ....St. Louis Park
Friedman, Harry S. ....Minneapolis
* Friedman, Jack ....Minneapolis
Friend, Charles A. ....Minneapolis
Fritsche, Albert ....New Ulm
Fritsche, Carl J. ....New Ulm
Fritsche, Theodore R. ....New Ulm
Fritz, Wallace L. ....St. Paul
Froats, Charles W. ....St. Paul
*† Frost, Edward H. ....Willmar
Frost, John B. ....Minneapolis
Frost, Russell H. ....Oak Terrace
Frykman, Howard M. ....Minneapolis
Frys, Russell N. ....Minneapolis
† Fugina, George R. ....Mankato
Fuller, Alice H. ....Minneapolis
Fuller, Benjamin F. ....St. Paul
Fuller, Josiah ....Duluth
Funk, Victor K. ....Oak Terrace
Furlow, William L. ....Faribault
Furman, Lucie C. ....Minneapolis
‡ Furr, Leo O. ....Long Beach, Calif.

Gaard, Richard C. ....Minneapolis
Gaebe, Milton B. ....Clara City
Gaida, Joseph B. ....St. Cloud
† Gallagher, Bernard J. ....Waseca
Gallett, Lester E. ....Minneapolis
Galligan, John J. ....St. Paul
† Galligan, Margaret M. ....Minneapolis
† Gambill, Carl M. ....Rochester
Gambill, Earl E. ....Rochester
Gamble, Elbert J. ....Bricelyn
Gamm, Edgar R. ....Triumph
Gammell, John H. ....Minneapolis
Garamella, Joseph J. ....Minneapolis
Garbrecht, Arthur Wm. ....St. Paul
† Gardner, Gawinn B. ....Rochester
Gardner, Jack K. ....Ceylon
† Gardner, John U. ....Rochester
Gardner, Victor H., Sr. ....Fairmont
Gardner, Walter P. ....St. Paul
Garlock, Arthur V. ....Bemidji
Garlock, Dewitt H. ....Highlands, Calif.
Garrow, Douglas M. ....St. Paul
Garske, George L. ....Minneapolis
Garten, Joseph L. ....Minneapolis
Garvey, James T. ....Minneapolis
Gastineau, Clifford F. ....Rochester
Gatchell, Frank G. ....Rochester
Gaunt, William D. ....Rochester
Gaviser, David ....Minneapolis
Gee, Vernon R. ....Rochester
Gehlen, Joseph N. ....St. Paul
Geib, Marvin J. ....Moorhead
Geiser, Peter M. ....Alexandria
Geraci, Joseph E. ....Rochester
Geurs, Benjamin R. ....Mankato
Ghormley, Ralph K. ....Rochester
† Ghostley, Mary C. ....Bemidji
Gibbs, Edward C. ....St. Paul
Gibbs, Robert W. ....Minneapolis
Giebenhain, John N. ....Minneapolis
Giere, Joseph C. ....Minneapolis
Giere, Richard W. ....Minneapolis
Giere, Silas W. ....Benson
* Giesen, Allan F. ....Starbuck
† Giffin, Herbert Z. ....Rochester

Giffin, Mary E. ....Rochester
Gifford, R. W., Jr. ....Rochester
Gilbert, Maurice G. ....Minneapolis
Gill, Theodore ....Albert Lea
Gillespie, Delmar R. ....St. Paul
Gillespie, Malcolm G. ....Duluth
Gilman, Lloyd C. ....Willmar
† Gilmore, Rowland ....Crookston
‡ Gilsdorf, Donald A. ....New York, N. Y.
Gingold, Benjamin A. ....Minneapolis
‡ Ginsberg, Robert L. ....San Antonio, Texas
† Girvin, Richard B. ....Minneapolis
Gislason, Solvig T. ....St. Peter
Gjerde, William P. ....Lake City
Glabe, Robert A. ....Plainview
Glaeser, John H. ....Minneapolis
Gleason, Wallace A. ....St. Paul
† Glew, William Bainbridge ....Rochester
† Glick, Dallas Donald ....Rochester
Glueck, Bernard C., Jr. ....Minneapolis
Goblirsch, Andrew P. ....Sleepy Eye
Goehrs, Gilman H. ....St. Cloud
† Goehrs, Henry W. ....St. Cloud
Goehrs, Homer R. ....Rochester
Goetz, Frederick C. ....Minneapolis
Goldberg, Isadore M. ....Minneapolis
Goldish, Daniel R. ....Duluth
Goldish, Robert J. ....Duluth
Goldman, Theodore I. ....Minneapolis
Goldner, Meyer Z. ....Minneapolis
Goldsmith, Joseph W. ....St. Paul
Goldstein, Norman P. ....Rochester
† Goltz, Edward V. ....St. Paul
Goltz, Robert W. ....Minneapolis
Good, C. Allen, Jr. ....Rochester
Good, Hoff D. ....Minneapolis
Good, Roy H. ....Glenwood
Goodchild, William R. ....Minneapolis
Goodman, Charles E. ....Virginia
Gordon, Philip E. ....Minneapolis
Gordon, Sewell S. ....St. Louis Park
Gowan, Lawrence R. ....Duluth
Grace, Joseph B. ....Rochester
† Graham, Archibald W. ....Chisholm
Grahek, Jack P. ....Ely
Granquist, Richard D. ....Coleraine
Grant, Hendrie W. ....St. Paul
Grant, John C. ....Sauk Centre
Grant, Suzanne ....Minneapolis
† Gratzek, Frank R. E. ....Minneapolis
Gratzek, Thomas ....St. Paul
Grau, R. K. ....St. Paul
Graves, Richard B. ....Red Wing
Gray, Edward F. ....White Bear Lake
† Gray, Frank D. ....Marshall
* Gray, Howard K. ....Rochester
Gray, Royal C. ....Minneapolis
Green, Paul A. ....Rochester
Green, Robert A. ....St. Louis Park
Greenberg, Albert J. ....Minneapolis
Greene, Daniel E. ....Thief River Falls
Greene, Laurence F. ....Rochester
Greenfield, Irving ....Minneapolis
Greenfield, William T. ....Cokato
† Greishiemer, Esther M. ....Philadelphia, Pa.
Gridley, John W. ....Arlington
Griebie, Grant L. ....Brownton
Griffin, John W. ....Bemidji
Griffin, R. P. ....Benson
† Griffiths, Edward K. ....St. Paul
Grimes, Burton P. ....St. Peter
Grimes, Marian ....Minneapolis
Grimell, Francis J. ....Minneapolis
Grindlay, John H. ....Rochester
Grinley, Andrew V. ....Grand Rapids
Grise, William B. ....Austin
Groch, Sigmund N. ....Rochester
Grohs, William H. ....Duluth
Gronvall, Paul R. ....Minneapolis
Groschupf, Theodore P. ....Bemidji
Grose, Frederick N. ....Clarissa
Gross, John B. ....Rochester
Grotting, John K. ....Minneapolis
Grundset, Ole J. ....Montrose
Guilbert, G. D. ....Minneapolis
Guilfoile, Pierre J. ....Delano
Gullickson, Glenn, Jr. ....Minneapolis
† Gullickson, Andrew ....Minneapolis
Gully, Raymond J. ....Cambridge
Gunlaugson, Frederick G. ....Minneapolis
Gushurst, Edward G. ....Minneapolis
Gustason, Harold T. ....Minneapolis
Guy, Jack A. ....New London

Haas, Jack F. ....Fairfax
Haavik, John E. ....Duluth
Habein, Harold C., Sr. ....Rochester
‡ Habein, Harold C., Jr. ....Wiesbaden, Germany
Haberer, Helen R. ....Minneapolis
Haberland, Lyle F. ....Minneapolis

† Haberman, Emil ....Osa
Haes, Julius E. ....Mank
Hagedorn, Albert B. ....Roches
Hagen, John D. ....Aus
Hagen, Kristofer ....Minneap
† Hagen, Olaf J. ....Moorhe
Hagen, Paul S. ....St. P
Hagen, Wayne S. ....Minneap
† Haggard, G. D. ....Minneap
Haines, Samuel F. ....Roches
Hakanson, Erick Y. ....St. P
Halbert, John J. ....Dulu
Halenbeck, Philip L. ....St. Clo
Hall, Barnard ....St. P
Hall, Harry B. ....Minneap
Hall, Wendell H. ....Minneap
Hall, William E. ....Maple La
Hallberg, Olav E. ....Roches
† Hallenbeck, Dorr F. ....Roches
Hallenbeck, George A. ....Roches
† Halliday, Phillip V. ....Dulu
Hallin, Roger P. ....Worthing
Halloran, Walter H. ....Jacks
Halme, William B. ....Wade
Halper, Bernard ....Hibb
Halpern, David J. ....Brews
Halpin, Joseph E. ....Rush C
Halversen, Donald E. ....Winneba
Halvorsen, Daniel K. ....Owaton
Halvorson, James W. ....Zumbro
Hamlon, John S. ....Fergus F
Hamel, Joseph I. ....Minneapo
Hammer, Lawrence M. ....Mank
Hammes, Ernest M., Sr. ....St. Pa
Hammes, Ernest M., Jr. ....St. P
† Haney, Claude L. ....Dulu
Hankerson, Robert G. ....Minnesota La
Hanlon, David G. ....Roches
Hannah, Hewitt B. ....Minneapo
† Hannon, Donald W. ....St. P
Hanover, Ralph D. ....International F
Hansen, Cyrus O. ....Minneapo
Hansen, Erling W. ....Minneapo
Hansen, Olga S. ....Minneapo
Hansen, Robert E. ....Hibbi
Hansen, Rollin M. ....Minneapo
Hansen, Theodore M. ....Albert L
† Hanson, Adolph M. ....Fariba
Hanson, Ernest O. ....Cloqu
Hanson, Everett C. ....New York Mi
Hanson, Harlow J. ....Minneapo
Hanson, Henry V. ....Minneapo
Hanson, John W. ....Northfie
Hanson, LeRoy W. ....Pelican Rapi
Hanson, Lewis ....Fro
Hanson, Malcolm B. ....Minneapo
Hanson, Mark C. L. ....Minneapo
Hanson, Norbert O. ....Rochest
Hanson, William A. H. ....Minneapol
Happe, Lawrence J. ....Minneapol
Harada, Thomas T. ....Lake Wilso
Harbaugh, John T. ....St. Pa
Hardy, William M. ....Rochest
Hargraves, Malcolm M. ....Rochest
Harmon, Gaius E. ....St. Pa
Harrington, Stuart W. ....Rocheste
Harrington, Vernon A., Jr. ....Dulut
Harris, Carl N. ....Hibbir
Harris, Leon D. ....Minneapol
Harris, Lloyd E. ....Rochest
Harrison, Percy W. ....Worthingto
Hart, William E. ....Monticel
Hartfiel, Herbert A. ....Montevide
Hartfiel, William F. ....St. Pa
Hartig, Marjorie ....St. Pa
Hartjen, Jason K. ....Bemid
*† Hartley, Everett C. ....St. Pa
Hartman, Evelyn E. ....Minneapo
Hartman, Howard R. ....Rochest
Hartnagel, G. F. ....Red Wi
Hartridge, Virginia B. ....Rochest
Hartung, Elmer H. ....Claremo
Hartwich, Roger F. ....Wino
Hass, Frederick M. ....Minneapo
† Hassett, Roger G. ....Manka
Hastings, DeForest R. ....Minneapo
Hastings, Donald W. ....Minneapo
† Hatch, Walter E. ....Dulu
Hauge, Erling T. ....Minneapo
Hauge, Malvin I. ....Clarkfie
Haugen, John A. ....Minneapo
Hauser, Donald C. ....Minneapo
Hauser, George W. ....Minneapo
Hauser, Victor P. ....St. Pa
Havel, Robert J. ....Minneapo
Haven, Walter K. ....Minneapo
† Havens, John G. W. ....Aust
Hawkinson, Raymond P. ....Minneapo
Hawley, George M. B. II. ....Red Wi
Hay, Lyle J. ....Minneapol
Hayes, Albert F. ....St. Pa
† Hayes, James M. ....Minneapol
Hayles, Alvin B. ....Rocheste

	Hays, Albert T.	Minneapolis
	Head, Douglas P.	Minneapolis
	Hebhel, Robert	Minneapolis
	Hebeisen, Milton B.	Chaska
	Heck, Frank J.	Rochester
	Heck, William W.	St. Paul
	Hedberg, Gustaf A.	Nopeming
	Hedemark, Homer H.	Ortonville
	Hedemark, Truman A.	Ortonville
	Hedenstrom, Frank G.	St. Paul
	Hedenstrom, Paul H.	Cambridge
	Hedenstrom, Philip C.	Marshall
	Hedin, Raymond F.	Red Wing
	Hedlund, Charles J.	Minneapolis
	Hedrick, William L.	Rochester
	Heegaard, William G.	Alexandria
	Hegge, Olav H.	Austin
	Hegge, Rolv S.	Austin
	Heiam, Wm. Conrad	Cook
	Heiberg, Emmett A.	Fergus Falls
	Heiherg, Olaf M.	Worthington
	Heilig, William R.	St. Paul
	Heilman, Dorothy M. H.	San Diego, Calif.
	Heilman, Fordyce R.	Rochester
	Heimark, John J.	Mankato
	Heimark, Julius J.	Fairmont
	Heinz, Ivy B.	Shakopee
	Heinz, Lawrence H.	Shakopee
	Heinzerling, Carl R.	Chaska
	Heise, Carl vR.	Winona
	Heise, Paul vR.	Winona
	Heise, Philip vR.	Winona
	Helland, John W.	Spring Grove
	Heller, Edgar E.	Mankato
	Helmholz, Henry F.	Rochester
	Helseth, Hovald K.	Pelican Rapids
	Helwig, Karl L., Jr.	Kerkhoven
	Hempel, Dean J.	Minneapolis
	Hempstead, Bert E.	Rochester
	Hench, Philip S.	Rochester
	Henderson, Arthur J. G.	No. St. Paul
	Henderson, Edward D.	Rochester
	Henderson, John W.	Rochester
	Henderson, Lowell L.	Rochester
	Henderson, Robert Earl	Rochester
	Hendrickson, John F.	Minneapolis
	Hengstler, William H.	St. Paul
	Henrikson, Earl C.	Minneapolis
	Henry, Clarence J.	Milaca
	Henry, Clifford E.	Kirksville, Mo.
	Henry, J. E.	Milaca
	Henry, Kenneth G.	Owatonna
	Henry, Martin R.	St. Peter
	Hensel, Charles N.	St. Paul
	Hepper, Norman G.	Rochester
	Herbert, Edna E.	Rochester
	Herbert, Willis L.	Minneapolis
	Herman, Samuel M.	St. Paul
	Hermann, Harold W.	Minneapolis
	Hermanson, Peter E.	Hendricks
	Heron, Roy C.	St. Paul
	Herrmann, Edgar T.	St. Paul
	Hertel, Garfield E.	Austin
	Hertz, Myron J.	St. Paul
	Hesla, Inman A.	Austin
	Hewitt, Edith S.	Rochester
	Hewitt, Richard M.	Rochester
	Heyerdale, Oscar C.	Rochester
	Higgins, John A.	Rochester
	Higgins, John H.	Minneapolis
	Higgs, Walter W.	Park Rapids
	Hilding, Anderson C.	Duluth
	Hilger, Andrew Wm.	St. Paul
	Hilger, Jerome A.	St. Paul
	Hilger, Laurence D.	St. Paul
	Hilgermann, George O.	Minneapolis
	Hilker, Marcus D.	St. Paul
	Hill, Earl	Minneapolis
	Hill, Elmer M.	Minneapolis
	Hill, Frederick E.	Riverside, Calif.
	Hill, John P.	Virginia
	Hill, John R.	Rochester
	Hill, Richard Woolsey	Rochester
	Hillis, Samuel J.	Minneapolis
	Hinckley, Rohert G.	Minneapolis
	Hinderaker, Harris P.	Bird Island
	Hines, Edgar A., Jr.	Rochester
	Hiniker, Louis P.	St. Paul
	Hinz, Walter E.	Willmar
	Hirschboeck, Frank J.	Duluth
	Hirsh, Stanton A.	Crookston
	Hirshfield, Frank R.	Minneapolis
	Hitchcock, Claude R.	Minneapolis
	Hochfilzer, John J.	St. Paul
	Hodapp, Robert V.	Willmar
	Hodgson, Corrin H.	Rochester
	Hodgson, Jane E.	St. Paul
	Hodgson, John R.	Rochester
	Hoehn, David	Holdingford
	Hoeper, Philip G.	Mankato
	Hoff, Herbert O.	Duluth
	Hoffbauer, Frederick W.	Minneapolis
	Hoffert, Henry E.	Minneapolis
	Hoffman, Roy A.	Minneapolis
	Hoffman, Walter L.	Minneapolis
	Hoganson, Donald E.	Bemidji
†	Hoidale, Andrew	Tracy
†	Holcomb, Joel T.	Marine-on-St. Croix
†	Holcomb, O. Wm.	St. Paul
	Holian, Darwin K.	Albert Lea
	Holland, C. R.	Rochester
†	Hollands, William H.	Fisher
	Hollenhorst, Robert W.	Rocbester
	Hollinshead, W. H.	St. Paul
	Holm, Donald F.	Benson
	Holman, Colin B.	Rochester
	Holmberg, Conrad J.	Minneapolis
†	Holmberg, L. J.	Canby
	Holmen, Robert W.	St. Paul
	Holmes, Alva E.	Rush City
	Holmstrom, Carle H.	Warren
	Holt, John E.	St. Paul
	Holzapfel, Fred C.	Minneapolis
	Hom, Leong Y. W.	North Chicago, Ill.
	Honath, Donald H.	Owatonna
†	Hooper, Worth A.	Long Beach, Calif.
	Hoover, Norman	Virginia
	Hopkins, G. Wendell	St. Paul
	Horns, Howard L.	Minneapolis
	Horns, Richard C.	Minneapolis
	Horton, Bayard T.	Rochester
	Hottinger, Raymond C.	Janesville
	Houglum, Arvid J.	Lake Park
	Houkom, Bjarne	Minneapolis
	Houkom, Samuel S.	Duluth
	Houle, Rollin J.	New Brighton
†	House, Zachariah E.	Burbank, Calif.
	Houts, Joseph C.	Dassel
	Hovde, Rolf	Winthrop
	Hovland, Melvin L.	Minneapolis
	Howard, Marshall I.	Mankato
	Howard, Merrill A.	St. Paul
	Howard, Robert B.	Minneapolis
	Howard, Solomon E.	Minneapolis
*	Howard, Willard S.	St. Paul
	Howe, Newell W.	St. Paul
	Howell, Carter W.	Minneapolis
	Howell, Llewelyn P.	Rochester
	Howell, Milton M.	Glencoe
	Hoyer, Ludolf J.	Windom
	Hruza, William J.	Madelia
	Hubin, Edwin G.	Sandstone
	Hudec, Elwyn R.	Echo
	Hudson, George E.	Minneapolis
	Huebert, Dan W.	Hutchinson
	Huenekens, Edgar J.	Minneapolis
†	Huffington, Herbert L.	Lutsen
	Huffington, Herb L., Jr.	Waterville
	Hughes, Bernard J.	Brainerd
	Hughes, Sidney O.	Winona
	Hullsiek, Harold E.	St. Paul
	Hullsiek, Richard B.	Fort Snelling
	Hult, John E.	Cloquet
	Hulteng, Donald B.	Minneapolis
	Hultkrans, Rudolph E.	Minneapolis
	Humphrey, E. W., Sr.	Moorhead
†	Humphrey, Wade R.	Stillwater
	Hunt, Arthur B.	Rochester
†	Hunt, Roscoe C.	Fairmont
	Hunt, William	Fergus Falls
	Hunter, James S., Jr.	Rochester
	Hunter, Murray H.	Farmington
	Hunter, Samuel W.	St. Paul
†	Hurd, Annah	Minneapolis
	Hurwitz, Milton N.	St. Paul
	Husebye, Kjeld O.	St. Paul
	Hustad, Edward G.	Montevideo
	Hutchinson, Dorothy W.	Oak Terrace
	Hutchinson, Henry	Moose Lake
†	Huxley, Frederick R.	Faribault
	Hymes, Charles	Minneapolis
†	Hynes, John E.	Minneapolis

†	Ide, Arthur W., Sr.	St. Paul
	Ide, Arthur W., Jr.	Minneapolis
	Idstrom, L. G.	Minneapolis
	Ikeda, Kano	St. Paul
	Indeck, Walter	Minneapolis
†	Indihar, John E., Jr.	Minneapolis
	Ingalls, Edgar G., Jr.	Minneapolis
†	Ingerson, Carl A.	St. Paul
	Inglis, William	Redwood Falls
	Ireland, Gerald W.	Nashwauk
†	Irvine, Harry G.	Minneapolis
	Iverson, Rolf M.	Minneapolis
	Ivins, John C.	Rochester

	Jackman, Raymond J.	Rochester
	Jackson, Sidney C.	Rochester
	Jackson, William C.	St. Paul
	Jacobs, Douglas L.	Willmar
†	Jacohs, Johannes C.	Willmar
	Jacobson, Clarence	Chisholm
	Jacobson, Clifford W.	Breckenridge
	Jacobson, Ferdinand C.	Duluth
	Jacobson, Loren J.	Minneapolis
	Jacobson, Wyman E.	St. Louis Park
	James, Ellery M.	St. Paul
	James, John W.	Mahtomedi
	Janecky, Allen G.	Baudette
	Janes, Joseph M.	Rochester
	Janssen, Martin E.	St. Paul
†	Jarvis, Bruce W.	St. Paul
	Jarvis, Charles W.	St. Paul
	Jarvis, Marilyn A.	St. Paul
†	Jarvis, Walter H.	Rochester
†	Jastrom, Rupert M.	St. Paul
	Jay, Alan R.	Minneapolis
	Jefferies, William L.	Minneapolis
	Jensen, Alvin M.	Brownton
	Jensen, Harry C.	Minneapolis
	Jensen, John A.	Crookston
†	Jensen, Marius J.	Minneapolis
	Jensen, Nathan K.	Minneapolis
	Jensen, Reynold A.	Minneapolis
	Jensen, Thorvold J.	Duluth
	Jenson, James E.	Stillwater
	Jerome, Bourne	Minneapolis
	Jerome, Elizabeth K. B.	Minneapolis
	Jeronimus, Henry J.	Duluth
†	Jesion, Joseph W.	Pine River
	Jessico, Charles M.	Duluth
	Jeub, Robert P.	Minneapolis
	Joffe, Harold H.	Virginia
	Johanson, Waldemar G.	St. Paul
†	Johnsen, Henry A., Jr.	Edina
	Johnson, Adelaide McF.	Rochester
	Johnson, Aldridge F.	Isle
	Johnson, Angelo G.	Minneapolis
	Johnson, Arthur B.	Minneapolis
	Johnson, August E.	Minneapolis
	Johnson, Carl E.	St. Paul
	Johnson, Carl Eric	Rochester
	Johnson, Carolyn A.	St. Paul
	Johnson, C. Percy	Tyler
	Johnson, Douglas L.	St. Paul
†	Johnson, Einer W., Sr.	Bemidji
	Johnson, Einer W., Jr.	Rochester
	Johnson, Emil W.	Minneapolis
	Johnson, Frank E.	Minneapolis
	Johnson, Harry A.	Minneapolis
	Johnson, Herbert W.	St. Paul
†	Johnson, James A.	Minneapolis
	Johnson, John W.	Minneapolis
†	Johnson, Julius	Minneapolis
	Johnson, Karl E.	Duluth
	Johnson, Malcolm R.	Minneapolis
	Johnson, Marvin W.	Dassel
†	Johnson, Morris B.	St. Paul
	Johnson, Norman P.	Minneapolis
	Johnson, Norton T.	Minneapolis
	Johnson, Olga H.	Moorhead
	Johnson, Orville H.	Omaha, Neb.
	Johnson, R. J.	St. Paul
	Johnson, Ralph B.	Lanesboro
	Johnson, Reinald G.	Minneapolis
	Johnson, Reuben A.	Minneapolis
	Johnson, Richard S.	Minneapolis
	Johnson, Robert E.	Minneapolis
	Johnson, Robert H.	Chisago City
	Johnson, Roger S.	Wayzata
	Johnson, Ronald G.	Minneapolis
	Johnson, Vilhelm M.	Dawson
	Johnson, William E.	Morgan
	Johnson, Youbert T.	Minneapolis
	Johnsrud, Luverne W.	Hihbing
	Johnston, Henry W.	Virginia
	Johnston, Leonard F.	Winona
*†	Johnston, Rufus O.	Fort Lauderdale, Fla.
	Johnstone, William W.	Ah-gwah-ching
	Jolin, Francis M.	Bovey
†	Jones, Alvah W.	Red Wing
	Jones, David G.	Minneapolis
†	Jones, E. Mendelssohn	St. Paul
†	Jones, Herbert W., Jr.	Minneapolis
	Jones, Orville H.	Mankato
	Jones, Richard H.	Minneapolis
†	Jones, Richard N.	St. Cloud
	Jones, Robcliff U., Jr.	Fairfield, Conn.
	Jones, William R.	Minneapolis
†	Jordan, Kathleen Smith	Granite Falls
	Jordan, Lewis S.	Granite Falls
	Josewich, Alexander	Minneapolis
	Josewski, Raymond J.	Stillwater
	Joyce, George L.	Rochester
	Judd, Allen S.	Minneapolis
	Judd, Edward S., Jr.	Rochester
	Judd, Walter H.	Washington, D. C.
	Juergens, Herman M.	Belle Plaine
	Juergens, John L.	Rochester
	Juergens, Manley F.	Stillwater
	Juers, Edward H.	Red Wing
†	Juliar, Richard O.	Los Angeles, Calif.
	Juntunen, Roy R.	Duluth
	Jurdy, Mitchell J.	Minneapolis
	Just, Herman J.	Hastings

†	Kaasa, Lawrence J.	Albert Lea
	Kadesky, Harold B.	Minneapolis
	Kaiser, Milton L.	New Ulm
	Kalin, Oscar T.	Minneapolis
	Kallestad, Leonard L.	Wayzata
	Kamman, Gordon R.	St. Paul
	Kanne, Earl R.	Brainerd
	Kantar, Bruce L.	Minneapolis
	Kaplan, David H.	St. Paul
	Kaplan, Harold A.	Minneapolis
	Kaplan, John J.	Minneapolis
	Kapsner, Alfred T.	Princeton
	Karges, L. E.	Grand Rapids
	Karleen, Bernard N.	Jackson
	Karleen, Conrad I.	Minneapolis
	Karlen, Markle	Minneapolis
	Karn, Jacob F.	Ortonville
	Karon, Irvin M.	St. Paul
	Kasper, Eugene M.	St. Paul
	Kath, Reinhard H.	Arlington
	Katz, Louis J.	Long Beach, Calif.
	Kaufman, Edward J.	Appleton
	Kaufman, Herschel J.	Minneapolis
	Kaufman, Walter B.	Mankato
	Kaufman, William C.	Appleton
	Kearney, Rochfort W.	Mankato
	Kearns, Thomas P.	Rochester
	Keating, F. Raymond	Rochester
	Keefe, Rolland E.	St. Paul
	Keil, Marcus A.	Albert Lea
	Keith, Haddow M.	Rochester
†	Keith, Norman M.	Rochester
	Keith, Paul J.	Milaca
	Keithahn, Elmer E.	Sleepy Eye
	Kelby, Gjert M.	Minneapolis
	Kelley, Walter M.	Duluth
	Kelly, Charles F.	Minneapolis
	Kelly, James H.	St. Paul
	Kelly, John F.	Cold Spring
	Kelly, John P.	Minneapolis
†	Kelly, John V.	St. Paul
	Kelly, Robert T.	Nashwauk
†	Kelsey, Carleton G.	St. Paul
	Kelsey, Chauncey M.	St. Paul
	Kemp, Alphonse F.	Mankato
	Kemper, James W.	Rochester
	Kenefick, Emmett V.	St. Paul
†	Kennedy, Claude C.	Minneapolis
	Kennedy, George L.	Faribault
†	Kennedy, Jane F.	Minneapolis
	Kennedy, Roger L. J.	Rochester
	Kenyon, Thomas J.	St. Paul
	Kerkhof, Arthur C.	Minneapolis
	Kernohan, James W.	Rochester
	Kesting, Herman	St. Paul
	Kevern, Jay L.	Henning
	Keyes, John D.	Winona
	Keyes, Robert W.	Pipestone
	Kiely, Joseph M.	Rochester
	Kierland, Robert R.	Rochester
	Kiesler, Frank, Jr.	Minneapolis
	Kilbride, Edwin A.	Worthington
	Kilby, Ralph Allen	Rochester
	Kimmel, George C.	Red Wing
†	King, Edgar A.	Minneapolis
	King, Frances W.	Oak Terrace
†	King, George L.	Hudson, Wis.
	Kinkade, Byron R.	Ada
	Kinports, Edward B.	International Falls
	Kinsella, Thomas J.	Minneapolis
	Kiolbasa, Edward B.	Stillwater
	Kippen, Neil	Breckenridge
	Kirby, Thomas J., Jr.	Rochester
†	Kirklin, B. R.	Rochester
	Kirklin, John W.	Rochester
	Kitzberger, Peter J.	New Ulm
‡	Klass, Donald W.	San Antonio, Texas
	Klefstad, Lloyd H.	Greenbush
	Klein, Harry	Duluth
*†	Klein, Henry N.	St. Paul
	Klein, William A.	Duluth
	Klima, William W.	Stewart
	Knapp, Frank N.	Duluth
	Knapp, Miland E.	Minneapolis
	Knight, Edwin G.	Swanville
	Knight, James Harry	Rochester
	Knight, Ralph T.	Minneapolis
†	Knight, Ray R.	Minneapolis
	Knoche, Harvey A.	Morgan
	Knoedler, John P.	Duluth
	Knudsen, Helen L.	Minneapolis
	Knutson, Gerhard E.	St. Paul
	Knutson, Lewis A.	Spring Grove
	Knutson, Robert C.	St. Paul
	Kodres, Nina	St. Paul
	Koelsche, Giles A.	Rochester
	Koenecke, F. H.	Lakefield
‡	Koenig, Robert P.	Geneva, N. Y.
	Koenigsberger, Charles	Mankato
	Koepcke, Gerald M.	Minneapolis
	Kohlbry, Carl O.	Duluth
†	Kohler, Delphin W.	Tacoma, Wash.
	Kolars, James J.	Faribault
	Koller, Hermann M.	Minneapolis
	Koller, Louis R.	Minneapolis
	Koller, Robert L.	Minneapolis
	Kooda, Jennings C.	Morris
	Koop, Herman E.	Cold Spring
	Korchik, John P.	Minneapolis
	Korda, Henry A.	Pelican Rapids
	Kosiak, John, Jr.	Minneapolis
	Koskela, Lauri E.	Keewatin
	Kostick, William R.	Fertile
	Kotchevar, Frank R.	Eveleth
	Kottke, Frederic J.	Minneapolis
	Kotval, Russell J.	Pipestone
	Koucky, Rudolph W.	Minneapolis
	Kovack, Freeman D.	Minneapolis
	Koza, Donald W.	St. Paul
	Kozberg, Oscar	Moose Lake
	Kraemer, George N.	Fairmont
	Krafft, Walter E.	Minneapolis
	Krause, C. W.	Fairmont
	Kremen, Arnold J.	Minneapolis
	Kreuzer, Titus C.	Marshall
	Krezowski, Thomas K.	St. Paul
	Krieser, Albert E.	Minneapolis
	Kroboth, Frank J., Jr.	Rochester
	Krout, Robert M.	Rochester
	Krueger, Victor R.	Nopeming
	Kruger, Elmer L., Jr.	Hibbing
	Krusen, Frank H.	Rochester
	Kruzick, S. J.	Sleepy Eye
†	Krystosek, Lee A.	Madison, Wisc.
	Kucera, Frank J.	Hopkins
‡	Kucera, Louis B.	Colo. Springs, Colo.
	Kucera, Stanley T.	Northfield
	Kucera, William J., Sr.	Minneapolis
	Kucera, William J., Jr.	Minneapolis
	Kugler, Alex A.	St. Paul
	Kuhlmann, Lawrence B.	Melrose
	Kuhn, Arthur J.	Rochester
	Kulstad, Oscar S.	Dodge Center
	Kulzer, Norbert J.	Hastings
‡	Kurtin, Joseph J.	New York, N. Y.
	Kuske, Albert W.	St. Paul
†	Kusske, Arthur L.	New Ulm
	Kusske, Bradley W.	St. Paul
	Kusske, Douglas R.	St. Paul
	Kusz, Clarence V.	Minneapolis
	Kvale, Walter F.	Rochester
	Kvitrud, Gilbert	St. Paul
	LaBree, John W.	St. Louis Park
	LaBree, Robert H.	Duluth
	LaFond, Edward M.	St. Cloud
	Laikola, Leslie A.	Adrian
†	Laird, Arthur T.	Duluth
†	Laioie, John M.	Minneapolis
	Lake, Clifford F.	Rochester
	Lamb, H. Douglas	Minneapolis
	Lang, Leonard A.	Minneapolis
‡	Lange, Robert D.	Washington, D. C.
	Langhoff, Arthur H.	Mankato
†	Langrall, Harrison M.	Rochester
	Lannin, Bernard G.	St. Paul
	Lannin, Donald R.	St. Paul
	Lapierre, Arthur P.	Minneapolis
	Lapierre, Jean T.	Minneapolis
	Larrabee, Walter F., Jr.	St. Paul
	Larsen, Frank Wm.	Minneapolis
	Larson, Arnold	Detroit Lakes
	Larson, Arthur N.	Madison
	Larson, Clarence M.	Minneapolis
	Larson, Donald M.	Minneapolis
†	Larson, Donald M.	St. Paul
	Larson, Dorette W.	Madison
	Larson, Eva-Jane	St. Paul
	Larson, James T.	So. St. Paul
	Larson, Keith D.	Moose Lake
	Larson, Kenneth R.	St. Paul
	Larson, Lawrence M.	Minneapolis
	Larson, Leighton W.	Waconia
	Larson, Leonard M.	Oak Terrace
	Larson, LeRoy	Bagley
	Larson, Martin L.	St. Paul
	Larson, Milo H.	Lake Benton
	Larson, Oliver E. H.	Zumbrota
	Larson, Paul N.	Minneapolis
	Larson, Ralph H.	Anoka
	Larson, W. G.	Northfield
	Laszewski, Franz von Zelberschwecht	St. Paul
	Latterell, Kenneth E.	Duluth
†	LaVake, Rae T.	Minneapolis
	Law, Harrison E.	Virginia
	Law, William M.	Rochester
	Lax, Morris H.	St. Paul
	Laymon, Carl W.	Minneapolis
	Lazarte, Jorge A.	Rochester
†	Leahy, Bartholomew	St. Paul
	Leavenworth, Richard O., Sr.	St. Paul
	Leavenworth, Richard O., Jr.	St. Louis Park
*†	Leavitt, H. H.	Minneap
*†	Lebowske, Joseph A.	Minneap
	Leck, Paul C.	Au
	Leddy, Eugene T.	Roches
	Lee, Gordon E.	Glenw
	Lee, Henry M.	Cambri
	Lee, Hubert W.	Brain
	Lee, Norman J.	Tr
*†	Lee, Walter N.	Claremont, Ca
	Leek, Joseph H.	Dul
	Leemhuis, Andrew J.	Minneap
	Leibold, Herbert H.	Parkers Pra
	Leick, Richard M.	St. P
	Leiferman, Robert J.	Minneap
	Leitch, Archibald	St. P
	Leland, Harold R.	Minneap
	Lenander, Mellvin E.	St. Pe
	Lenarz, Albert J.	Browerv
	Lende, Norman	Fariba
	Lenz, Joseph R.	Mor
	Lenz, Otto A.	Minneap
	Leonard, Lawrence J.	Minneap
	Leonard, Samuel	Minneap
†	Leopard, Brand A.	Brownsville, Te
	Lepak, Francis J.	Dul
	Lepak, John A.	St. P.
	Leppo, N. Erkki A.	Dul
†	Lerche, William	Cable, W
	Lerner, A. Ross	Minneap
‡	Lescoe, Richard J.	Ellington AF Te
	Lester, Malcolm J.	Trum
‡	Letson, Robert D.	Glenwo
	Leven, N. Logan	St. P.
	Leverenz, Carleton W.	St. P.
*	Levin, Bert G.	St. P
	Levitt, George X.	St. P
	Lewis, Arthur J.	Henn
	Lewis, Charles W.	Henn
†	Lewis, Claude B.	St. Clo
	Lewis, F. John	Minneapo
	Lewis, Joyce S., Jr.	Minneapo
†	Lexa, Frank J.	Lonsd
*	Libert, John N.	St. Clo
	Lick, Charles L.	St. Pa
	Lick, Louis C.	St. Pa
	Lick, William J., Jr.	St. Pa
†	Liedloff, Adolph G.	Manka
	Lien, Richard J.	St. Pa
	Lienke, Roger I.	Minneapo
	Liffrig, William W.	Red Wi
†	Lightbourn, Edgar L.	Hastin
	Lilleberg, Norbert J.	St. Pa
	Lillehei, C. Walton	Minneapo
	Lillehei, Elmer J.	Robhinsda
†	Lillie, Harold I.	Rochest
	Lillie, John C.	Rochest
	Lima, Ludvig R.	Montevid
	Limbeck, Donald A.	Le Sue
‡	Lind, Carl J., Jr.	Washington, D.
	Lindahl, Merlyn J.	Sherbur
	Lindberg, Alfred L.	Wheat
	Lindberg, Arthur N.	Minneapol
†	Lindberg, Arvid C.	Minneapol
	Lindberg, Vernon L.	Minneapol
	Lindberg, Winston R.	Minneapol
	Lindblom, Alton E.	North Manka
	Lindblom, Maurice L.	Minneapol
†	Linde, Herman	Cyr
	Lindell, Robert	St. Pa
	Lindeman, Raymond J.	Paynesvil
	Lindemann, Charles E.	Minneapol
	Lindgren, Russell C.	Minneapol
	Lindner, Janus C.	Minneapol
	Lindquist, Richard H.	Minneapol
	Linner, Gunnar	Minneapol
†	Linner, Henry P.	Minneapol
	Linner, John H.	Minneapol
	Linner, Paul W.	Minneapol
	Lippman, Hyman S.	St. Pa
	Lippman, Elmer W.	Hutchinso
	Lippman, Emanual S.	Minneapol
	Lipschultz, Oscar	Minneapol
	Lipscomb, Paul R.	Rocheste
†	Litchfield, John T.	Minneapol
	Litin, Edward M.	Rocheste
	Litman, Abraham B.	Minneapol
	Litman, Samuel N.	Dulut
	Litzow, Thaddeus	Rocheste
	Lober, Paul H.	Minneapol
	Loes, Louis A.	St. Clou
	Lofgren, Karl A.	Rocheste
	Lofsness, Stanley V.	St. Pau
	Lofstrom, Dennis E.	Pine Rive
†	Logan, Archibald H.	Rochester
	Logan, George B.	Rocheste
†	Logefeil, Rudolph C.	Minneapolis
	Lohmann, John G.	Pipestone
	Loken, Selmer M.	St. Pau
	Loken, Theodore	Ada
	Lommen, Peter A.	Austin
	Longfellow, Helen W.	Brainerd
†	Loomis, Earl A.	Minneapolis

Loomis, George L.	Winona
Lorentzen, Ernest S.	Detroit Lakes
Lorton, William L.	Rochester
Lott, Frederick H.	Minneapolis
Lonisell, Charles T.	Fairmont
Love, Frederick A.	Carlos
Love, J. Grafton	Rochester
Lovett, Beatrice R.	Oak Terrace
Lowe, Earl R.	So. St. Paul
Lowe, Thomas A.	So. St. Paul
Lowry, Elizabeth C.	Minneapolis
Lowry, Paul	Minneapolis
Lowry, Thomas	Minneapolis
Luck, Hilda	Mankato
Luckemeyer, Carl J.	St. Cloud
Lueck, Wallace W.	Minneapolis
Lufkin, Nathaniel H.	Minneapolis
Lukk, Olaf	Montgomery
Lund, Carl J. T.	Fergus Falls
Lund, George W.	Minneapolis
Lund, Werner J.	Staples
Lundberg, Ruth I.	Minneapolis
Lundblad, Robert M.	Minneapolis
Lundblad, Roy A.	Minneapolis
Lundblad, Stanley W.	Minneapolis
Lundeberg, Karl R.	Minneapolis
Lundell, Carl L.	Granite Falls
Lundholm, Arthur M.	St. Paul
Lundquist, Curt W.	Owatonna
Lundquist, Virgil J. P.	Minneapolis
Lundsten, Leslie C.	Bemidji
Lundsten, Lloyd R.	Rochester
Lundy, John S.	Rochester
Lynch, Francis W.	St. Paul
Lynch, Matthew J.	Minneapolis
Lynn, Thomas E.	Rochester
Lyons, James H.	Minneapolis
Lyons, Michael W.	Minneapolis
Lysne, Henry	Minneapolis
Lysne, Myron	Minneapolis
Lysyj, Anatol	Minneapolis
Lyzenga, Anton G.	Minneapolis
McBean, J. B.	Rochester
McCabe, James S.	St. Paul
McCaffrey, F. John	Minneapolis
McCain, Donovan L.	St. Paul
McCann, Eugene J.	Minneapolis
McCannel, Malcolm A.	Minneapolis
McCarten, Francis M.	Stillwater
McCarthy, Austin M.	Willmar
McCarthy, Donald	St. Paul
McCarthy, Joseph J.	St. Paul
McCartney, James S.	Minneapolis
McCarty, Paul D.	Ely
McClanahan, James H.	White Bear Lake
McClanahan, T. S.	White Bear Lake
McClellan, Robert J.	St. Paul
McCloud, Charles N., Jr.	St. Paul
McConahey, William M., Jr.	Rochester
McCormick, Donald P.	Minneapolis
McCoy, Mary K.	Duluth
McDaniel, Oriana	Minneapolis
McDonald, Archibald L.	Duluth
McDonald, John R.	Rochester
McDonald, Owen G.	Duluth
McDonald, William J.	Crookston
McDowell, John P.	St. Cloud
McEnaney, Clifford T.	Owatonna
McEwan, Alexander	St. Paul
McFarland, Arthur H.	Minneapolis
McGandy, Robert F.	Minneapolis
McGeary, George E.	Minneapolis
McGroarty, Brian J.	St. Paul
McGroarty, John J.	Easton
McHaffie, Orval L.	Duluth
McHardy, Bryson R.	Chicago, Ill.
McIlhany, Mary Lou	Wheeler, Texas
McInerney, Maurice W.	Minneapolis
McIntire, Homer M.	Waseca
McIntyre, John A.	Owatonna
McKaig, Alan M.	Red Lake Falls
McKaig, Carle B.	Pine Island
McKay, John W.	Rochester
McKay, Walter E.	Altadina, Calif.
McKelvey, John L.	Minneapolis
McKenna, Elizabeth M.	Austin
McKenna, Jay K.	Austin
McKenna, John J.	Virginia
McKenna, Maurice J.	Grand Rapids
McKenzie, Charles H.	Minneapolis
McKenzie, Eva Elaine	St. Paul
McKinlay, Chauncey A.	Minneapolis
McKinney, Frank S.	Minneapolis
McLane, William O.	Brainerd
McLaughlin, Byron H.	Minneapolis
McLaughlin, Edmund M.	Winona
McLeod, John J., Jr.	Rochester
McManus, William F.	Princeton
McMurtrie, William B.	Minneapolis
McNear, George R., Jr.	Mankato
McNeil, John J.	Minneapolis
McNeill, J. A.	St. Paul
McNutt, John R.	Duluth
McPheeters, Herman O.	Minneapolis
† McQuarrie, Irvin	Minneapolis
McSweeny, Austin J.	Danville, Ill.
MacCarty, Collin S.	Rochester
† MacCarty, William C.	Rochester
MacDonald, Daniel A.	Minneapolis
MacDonald, John W.	Minneapolis
MacDonald, Roger A.	Littlefork
MacKinnon, Donald C.	Minneapolis
MacLean, Alexander R.	Rochester
MacRae, Gordon C.	Duluth
Mach, Frank B.	Minneapolis
Mach, Ralph F.	Pine City
Macklin, William E., Jr.	Willmar
Mackoff, Sam M.	Phoenix, Ariz.
Madalin, Herbert E.	Rochester
Madland, Robert S.	St. Paul
Maeder, Edward C.	Minneapolis
Magath, Thomas B.	Rochester
Magness, John L.	Rochester
Magney, Fredolph H.	Duluth
Magnuson, Allen E.	Wheaton
Magnuson, Raymond C.	Cambridge
Magraw, Richard M.	Minneapolis
Mahle, Donald G.	Plainview
Mahowald, Aloys	Fergus Falls
Maitland, Edwin T.	Jackson
† Maland, Clarence O.	Minneapolis
Malerich, J. Anthony	St. Paul
Malerich, J. Anthony, Jr.	St. Paul
Malmstrom, John A.	Virginia
Mandel, Sheldon L.	Minneapolis
Manger, William M.	Rochester
Mankey, James C.	Minneapolis
Mankin, Harold T.	Rochester
Mann, George A.	Minneapolis
† Manson, Frank M.	Worthington
*†Marcley, Walter J.	Minneapolis
Marking, George H.	Minneapolis
Marks, Roger W.	St. Paul
Marrone, Patrick H.	Duluth
Martin, Albert C.	Luverne
Martin, Dwight L.	St. Paul
Martin, Frank E.	Minneapolis
Martin, George B.	Thief River Falls
Martin, George R.	Minneapolis
Martin, Gordon M.	Rochester
† Martin, Thomas Philip	Arlington
Martin, Webster C.	Duluth
Martin, William B.	Duluth
Martin, William J.	Rochester
Martineau, Joseph L.	St. Paul
Martinson, Carl J.	Wayzata
Martinson, Elmer J.	Wayzata
Masson, Duncan M.	Rochester
† Masson, James C.	Rochester
Masson, James K.	Rochester
Mast, Frederic L.	Chisholm
Mateo, Guillermo	St. Paul
Mathieson, Don R.	Rochester
Matthews, James H.	Minneapolis
Matthews, Louis B., Jr.	Rochester
Mattill, Peter M.	Oak Terrace
Mattison, Percy A.	Winona
Mattson, Albert D.	St. James
Mattson, Hamlin A. N.	Minneapolis
Maunder, John B.	Minneapolis
‡ Maus, Philip	New Orleans, La.
Maxeiner, Stanley R., Sr.	Minneapolis
Maxeiner, Stanley R., Jr.	Minneapolis
Mayne, John Gregory	Rochester
Mayne, Roy M.	Nopeming
Mayo, Charles W.	Rochester
Mazzitello, William F.	St. Paul
† Mead, Charles H.	Duluth
Meade, John R.	St. Paul
Mears, Burtis J.	St. Paul
Mears, Robert F.	Northfield
Medelman, John P.	St. Paul
Meinert, Albert E.	Winona
Meinert, John K.	Willmar
Melancon, Joseph F.	St. Paul
† Melby, Benedik	Blooming Prairie
Meller, Maurice	Brainerd
Meller, Robert L.	Minneapolis
† Melzer, George R.	Lyle
Menefee, Edward C.	Albert Lea
Menold, William F.	St. Paul
Mensheha, Nicholas	Forest Lake
Mercil, William F.	Crookston
Merkert, Charles E.	Minneapolis
Merkert, George L.	Minneapolis
Merner, Thomas B.	Faribault
† Merrick, Charlotte T.	St. Paul
Merrick, Robert L.	St. Paul
Merrill, Robert W.	Morris
Merriman, Lloyd L.	Duluth
Merritt, Wallace A.	Rochester
† Mesker, George H.	Olivia
† Messer, James W.	Rochester
Metcalf, Norman B.	Princeton
Metz, Donald D.	Buffalo Lake
Meyer, Alvin J.	Minneapolis
Meyer, Anthony A.	Melrose
† Meyer, Ette L.	Minneapolis
Meyer, Frederick C.	Kenyon
Meyer, Paul F.	Faribault
Meyer, Robert J.	Minneapolis
‡ Meyer, Robert P.	Faribault
† Meyerding, Edward A.	St. Paul
† Meyerding, Henry Wm.	Rochester
Michael, Joseph C.	Minneapolis
Michel, Henry H.	Minneapolis
Michels, Roger P.	Willmar
Michelson, Henry E.	Minneapolis
Michienzi, Leonard J.	St. Paul
† Mickelsen, Emma F.	Minneapolis
† Mickelson, John C.	Durham, N. C.
‡ Midboe, Gilbert T.	St. Paul
Midthune, A. S.	Lake Park
Miettunen, John B.	Chisholm
Milhaupt, E. N.	St. Cloud
Miller, Albert G.	St. Paul
Miller, Arden L.	Minneapolis
Miller, Harold E.	Minneapolis
‡ Miller, Herman	Reading
Miller, Hugo E.	Minneapolis
Miller, James R. Scott	Rochester
Miller, John C.	Minneapolis
Miller, Roland D.	Rochester
Miller, Ross H.	Rochester
† Miller, Victor I.	Mankato
*†Miller, William Anthony	New York Mills
Miller, William P.	Montevideo
‡ Miller, William T.	Minneapolis
Miller, Winston R.	Red Wing
Miller, Z. R.	St. Paul
Millett, D. Keith	Minneapolis
Millikan, Clark H.	Rochester
Mills, John L.	Winnebago
Mills, Stephen D.	Rochester
Milnar, Frank J.	St. Paul
Milton, John S.	Minneapolis
Minge, Raymond K.	Worthington
Minsky, Armen A.	Minneapolis
Mintz, Charles M.	St. Paul
† Misbach, William D.	Sherman Oaks, Cal.
Mishek, Charles J.	St. Paul
Mitby, Irving L.	Minneapolis
Mitchell, Berton D.	Minneapolis
Mitchell, Edwards C.	Minneapolis
Mitchell, Mancel T.	Minneapolis
Mixer, Harry W.	Minneapolis
Moberg, Clarence W.	Detroit Lakes
Moberg, Thomas D.	Tacoma, Wash.
Moe, John H.	Minneapolis
Moe, Thomas	Moose Lake
Moehn, John T.	Minneapolis
Moehring, Henry G.	Duluth
Moen, Johannes K.	Minneapolis
Moersch, Frederick P.	Rochester
Moersch, Herman J.	Rochester
† Moertel, Charles G.	Rochester
Moga, John A.	St. Paul
Molander, Herbert A.	St. Paul
Molenaar, Robert E.	Cannon Falls
Mollers, Theodore P.	Soudan
† Monahan, Elizabeth S.	Minneapolis
Monahan, Robert H.	St. Paul
Monroe, Paul B.	Cloquet
Monserud, Nels O.	Cloquet
Monson, Einer M.	Minneapolis
Monson, Leonard J.	Canby
Montgomery, Hamilton	Rochester
Mooney, Robert P.	St. Paul
Moore, Irvin H.	Minneapolis
Moorhead, Marie	Minneapolis
Moos, Daniel J.	Minneapolis
† Moquin, Marie A.	St. Paul
† Morehead, Dewey E.	Owatonna
† Moren, J. Adelaide	White Bear Lake
Morgan, Edward R.	Rochester
Morgan, Hugh O.	Amboy
Moriarty, Berenice	St. Paul
Moriarty, Cecile R.	St. Paul
Mork, A. Harold	Anoka
Mork, Frank E.	Anoka
Morlock, Carl G.	Rochester
Morrison, Charlotte J.	Minneapolis
Morrow, George W., Jr.	Rochester
Morse, Morton P.	LeRoy
Morsman, L. William	Hibbing
Mortensen, Nels G.	Minneapolis
Mortenson, Howard O.	Menahga
Mosby, Maurice E.	Long Prairie
Moses, Royal R.	Kenyon
Mosser, Donn G.	Minneapolis
‡ Moulton, K. B.	St. James
Mouritsen, Glenn J.	Fergus Falls
Moyer, John B.	Duluth
Moyer, Leonard B.	Minneapolis
Mudd, Robert H.	Rochester
Mueller, Donald R.	Bagley
Mueller, Rudolph B.	Richmond

Muesing, William J.....New Ulm
Muir, Walter F.....Browns Valley
Mulder, Donald W.....Rocbester
Mulholland, William M.....Minneapolis
Muller, A. Engene.....No. St. Paul
Mulligan, Arthur M.....Brainerd
Mundahl, Harold R.....St. Paul
Munson, Martin S.....Barnum
Murphy, Edmund P.....Minneapolis
Murphy, Jack T.....St. Paul
Murphy, Joseph E.....Marshall
Murray, Robert A.....Hibbing
Musachio, Nicholas F.....Foley
Muske, Marvin M.....Minneapolis
Mussey, Mary E.....Rochester
† Mussey, Robert D.....Rochester
Musty, Nicbolas J.....Minneapolis
Myers, Jay A.....Minneapolis
Myers, John W.....Canby
‡ Myers, Richard L...Selfridge AFB, Mich.
Myers, Thomas T.....Rocbester
Myhre, James A.....Minneapolis
Myre, Clifford R.....Paynesville
Myre, Theodore T.....Rochester

† Naegeli, Frank.....Fergus Falls
Nagel, Harold D.....Minneapolis
Nakamura, James Y.....Deer River
Nash, Eldore B.....Eden Valley
Nash, Leo A.....St. Paul
Naslund, Ames W.....Minneapolis
Neal, Joe M.....St. Paul
Nealy, Donald E.....Adrian
Neary, Richard P.....Minneapolis
Neel, Harry B.....Albert Lea
Neff, Walter S.....Virginia
Nehring, Jesse P.....Preston
Neibergs, Lidija.....St. Paul
Neibergs, Pauls.....St. Paul
Neils, Vernon E.....Sauk Rapids
Nelson, Bernette G.....Minneapolis
Nelson, Bernice A.....Minneapolis
Nelson, Carleton A.....Minneapolis
Nelson, C. Barton.....Minneapolis
Nelson, Clayton E.....Albert Lea
Nelson, Edward N.....Minneapolis
Nelson, Ernest J.....Lonsdale
Nelson, Glenn E.....Fairfax
Nelson, Harvey.....Minneapolis
† Nelson, Henry E.....Crookston
Nelson, Kenneth L.....Warroad
Nelson, Lloyd S.....Minneapolis
Nelson, Loren E.....St. Paul
† Nelson, Louis A.....St. Paul
Nelson, Louis A., Jr.....St. Paul
Nelson, Luther A.....Rush City
Nelson, Maxine O.....Minneapolis
Nelson, Maynard C.....Minneapolis
Nelson, Melvin S.....Granite Falls
† Nelson, Nesmith P.....Minneapolis
Nelson, O. L. Norman.....Minneapolis
Nelson, Robert H.....Benson
* Nelson, Robert L.....Duluth
Nelson, Roy A.....Fergus Falls
Neson, Wallace I.....Minneapolis
Nelson, Wilburn O. B.....Fergus Falls
Nelson, William C.....Rochester
Nerenberg, Samuel T.....Minneapolis
Nesbitt, Samuel.....Minneapolis
Nesheim, Martin O.....Emmons
Nessa, Curtis B.....St. Cloud
Nesse, J. A.....Austin
Nesset, Lawren B.....Minneapolis
Nesset, William D.....Minneapolis
Neumaier, Arthur.....Glencoe
Neumann, Conrad A.....Lewiston
Neumeister, Charles A.....Minneapolis
Newnum, Raymond L.....Rochester
Nice, Charles M.....Minneapolis
Nichols, Donald R.....Rochester
Nicholson, Murdoch A.....Duluth
Nicholson, Richard W.....Heron Lake
Nickerson, John R.....Fairmont
Nickerson, Neil D.....Fairmont
Nielsen, Alvin M.....Northfield
Nietfeld, Aloys B.....Sauk Centre
Nilson, Helmer J.....North Mankato
Nimlos, Kenneth O.....St. Paul
† Nimlos, Lenore O.....St. Paul
Ninneman, Newton N.....Waconia
Nisius, George.....Duluth
Noble, John F.....St. Paul
Noble, J. Lawrence.....St. Paul
Nollet, Donald J.....Hibbing
Noran, Axel S. N.....Minneapolis
Noran, Harold H.....Minneapolis
Norbert, Carl E.....Cloquet
Nord, J. Erling.....Hallock
Nord, Robert E.....Edina
Nordin, Gustaf T.....Minneapolis
Nordland, Martin, Sr.....Minneapolis
Nordland, Martin, Jr.....Minneapolis
Nordman, Willard F.....Mora
Norman, David D.....St. Paul
Normann, Stephen T., Jr.....Waseca
Norris, Neil T.....Caledonia
*†Noth, Henry W.....Minneapolis
† Novak, Edward E.....New Prague
Nuebel, Charles J.....St. Paul
Nuessle, Walter G.....Springfield
Nuessle, William F.....Minneapolis
Nuetzman, Arthur W.....Faribault
Nutting, Roland E.....Duluth
Nydahl, Malvin J.....Minneapolis
Nye, Katherine A.....St. Paul
Nye, Lillian L.....St. Paul
Nygren, William T.....Braham
Nylander, Emil G.....Minneapolis
Nywall, Dean D.....Slayton

O'Brien, J. C.....St. Paul
O'Brien, Louis T.....Breckenridge
† O'Connor, Daniel C.....Eden Valley
† O'Connor, Loren J.....St. Paul
O'Donnell, James E.....Minneapolis
O'Hanlon, John A.....Minneapolis
O'Kane, Thomas W.....St. Paul
O'Keefe, James P.....St. Cloud
O'Keefe, Mathew E., Jr.....Rochester
O'Leary, John B.....Brainerd
* O'Leary, Paul A.....Rochester
O'Malley, Valentine.....St. Paul
O'Neill, John C.....Duluth
O'Phelan, E. Harvey.....Minneapolis
O'Reilley, Bernard E.....St. Paul
‡ O'Shaughnessy, Edward J.....
Camp Kilmer, N. J.
† Oberg, Carl M.....Minneapolis
Ochsner, Clarence G.....Wabasha
Ockuly, Orville.....St. Paul
Odel, Howard M.....Rochester
Odland, Donald M.....Luverne
Odland, Mark E.....Detroit Lakes
Odland, Olin M.....Granite Falls
Oeljen, Siegfried C. G.....Waseca
Ogden, Warner.....St. Paul
Ohage, Justus.....St. Paul
Olavs, Olga.....Minneapolis
Olds, George H.....New Richland
Olfelt, Paul C.....Minneapolis
Olive, John T.....Mankato
Oliver, Irwin L.....Graceville
Olmanson, Edmund G.....St. Peter
Olsen, Arthur M.....Rochester
Olsen, E. George.....Minneapolis
Olsen, Ralph L.....St. Paul
Olson, Albert E.....Duluth
Olson, Albert J.....Owatonna
Olson, Alton C.....Minneapolis
Olson, Archie O.....Duluth
Olson, Carl J.....Minneapolis
Olson, C. Kent.....Minneapolis
Olson, Charles A.....St. Paul
Olson, Chester J.....Belle Plaine
Olson, Detlof M.....Minneapolis
Olson, Duane O. C.....Gaylord
Olson, Ernest A.....Pine Island
Olson, Grant E.....West Concord
Olson, Gregory M.....Litchfield
Olson, Lillian A.....Ah-gwah-ching
† Olson, Olof A.....Minneapolis
Olson, Philip A.....Minneapolis
Olson, Rolland A.....Wayzata
† Onifer, Theodore Michael.....Rochester
Onsgard, L. Kenneth.....Houston
Oppegaard, C. L.....Crookston
Oppen, E. Gerhard.....Minneapolis
Oppen, Melvin G.....Wayzata
Opsahl, Lawrence J.....Willmar
Opstad, Earl T.....Minneapolis
Orr, Burton A.....Faribault
‡ Orwoll, Harold S.....Japan
Osborn, Donald O.....Austin
Osborn, John E.....Rochester
Ostergaard, Erling.....Evansville
Ostergren, Edward W.....St. Paul
Ouellette, Alfred J.....St. Paul
Ourada, Anthony L.....Fairmont
Owen, Charles A., Jr.....Rochester
Owens, Ben P.....Hibbing
Owens, Frederick M., Jr.....St. Paul
Owens, William A.....Montevideo
Ozolins, Marta.....Faribault

Paal, Dwain J.....Minneapolis
† Paciotti, Vincent J.....Minneapolis
Page, Raymond L.....St. Charles
Palen, Benjamin J.....Minneapolis
Palmer, Clinton F.....Albert Lea
Pankratz, Peter J.....Mountain Lake
Papermaster, Ralph.....Two Harbors
Papermaster, Theodore C.....Minneapolis
‡ Paris, Jaime.....Rochester
Park, Wilford E.....Minneapolis
Parker, Charles W.....Wadena
Parker, Harry L.....Rochest
Parker, Philip J.....Hallo
Parker, Robert L.....Rochest
Parker, Warren E.....Sebel
Parkhill, Edith M.....Rochest
Parkin, Thomas W.....Rochest
Parson, E. Irvine.....Dulu
Parson, E. Lillian B.....Elbow La
Parson, Lester R.....Elbow La
Parsons, R. A.....St. Jam
Parsons, Ralph L.....Monter
Parsons, William B., Jr.....Rochest
Pasek, Antone W.....Cloqu
† Pasek, Edward A.....Minneapo
Patch, Orien B.....Dulu
Patrick, Robert T.....Rochest
Pattee, James J.....Minneapo
Patterson, Hugh D.....Slayt
† Patterson, William L.....Fergus Fa
Paulson, Elmer C.....Minneap
Paulson, John A.....Rochest
† Paulson, Theodore S.....Fergus Fa
Paulson, Wallace J.....Minneap
Pearce, Francis M., Jr.....Rochest
† Pearsall, R. P.....Virgin
Pearson, Bror F.....Shakop
Pearson, Fritz R.....St. Pa
Pearson, Malcolm M.....St. Pa
Pease, Gertrude L.....Rochest
† Peck, Owen C.....Rochest
Pedersen, Arthur H.....St. Pa
Pedersen, Robert L.....Braine
Pedersen, Roy C.....Dulu
Peltier, Leonard F.....Minneapo
Peluso, Charles R.....Minneapo
Pemberton, Albert H.....Rochest
† Pemberton, John.....Rochest
† Penhall, Fletcher W.....Mort
Penk, Engward L.....Springfie
Penn, George E.....Manka
† Pennie, Daniel F. V.....Dulu
Peppard, Thomas A.....Minneapo
‡ Perkins, Douglass E.....Alexandr
Perlman, Everett C.....Minneapo
Perlman, Herschel L.....Minneapo
Perry, Harold.....Rochest
Person, John P.....Albert L
Pertl, Albert L.....Can
Peteler, Jennings C. L.....Minneapo
† Peterman, Albert F.....Rochest
Peters, Gustavus A.....Rochest
Petersen, D. H.....Northfie
Petersen, Deane A.....Minneapo
Petersen, Glenn L.....Minneapo
Petersen, Magnus C.....Rochest
Petersen, Peter C.....Minneapo
Petersen, Robert T.....St. Clo
Petersen, William E.....Minneapo
† Peterson, Alice H.....Minneapo
Peterson, Alvin C.....Mo
Peterson, David B.....St. Pa
Peterson, Donald H.....St. Pa
Peterson, Edward N.....Virgi
Peterson, Harold O.....St. Pa
Peterson, Henry.....Minneapo
Peterson, Herbert W.....Minneapo
Peterson, Joel L. E.....St. Pa
Peterson, John H.....Dulu
Peterson, Kenneth A.....Marsh
† Peterson, Lowell F. A.....Rochest
Peterson, Nordahl P.....Minneapo
Peterson, Oliver H., Sr.....Minneapo
Peterson, Palmer A.....Minneapo
† Peterson, Peter E.....Minneapo
Peterson, Roy A.....Ve
Peterson, Roy L.....White Bear La
Peterson, Stanley C.....Aus
Peterson, W. H.....Aus
Peterson, Willard C.....Minneapo
Peterson, Willard E.....Willm
Petit, Julien V.....Minneapo
Petit, Leon J.....Minneap
Pettersen, George R.....Ma
‡ Pettet, John R.....Fort Ord, Cal
Pewters, John T.....Minneapo
Peyton, William T.....Minneapo
† Phalen, Patrick T.....Roches
Phares, Otto C.....St. Clo
Phelps, Kenneth A.....Minneap
Phillips, Donald F.....Roches
Philp, David R.....Waterto
Pierce, Charles H.....Wade
Pierce, Jack R.....Virg
Pierce, Robert B.....Oli
Pierson, Roy F.....Slayt
† Piper, Monte C.....LaCanada, Ca
Piper, William A.....Mountain L
Pittelkow, Robert B.....Roches
Plasha, Matthew K.....Ano
Plass, Herbert F. R.....Minneap
† Platou, Erling S.....Minneap
Pleissner, Karl W.....Minneapo
Plimpton, Nathan C., Jr.....Minneapo
† Plondke, Fred J.....White Bear L

Plothe, Harry L.	St. Paul
Plucker, Milton W.	Worthington
Pogue, Richard E.	Watertown
Pohl, John F. M.	Minneapolis
Poirier, Joseph A.	Forest Lake
Polley, Howard F.	Rochester
Pollock, Anthony J.	Minneapolis
Pollock, David K.	Minneapolis
Polski, Paul G.	So. St. Paul
Polzak, Jacob A.	Minneapolis
Pone, John	Cambridge
Ponterio, James E.	Shakopee
Pool, Thomas L.	Rochester
Poppe, Frederick H.	Minneapolis
Porter, Oliver M.	Atwater
Post, Edmund A.	St. Paul
Potek, David	Cambridge
Potter, Robert B.	Minneapolis
Powelson, Myron H.	San Francisco, Cal.
Power, John E., Sr.	Duluth
Power, John E., Jr.	Duluth
Pratt, Fred J., Sr.	Minneapolis
Pratt, Fred J., Jr.	Minneapolis
Pratt, George F.	Rochester
Pratt, Joseph H., Jr.	Rochester
Preine, Irving A.	Osseo
Preisinger, Joseph W.	Dallas, Texas
Prem, Konald A.	Minneapolis
Preston, Paul J.	Minneapolis
Price, Mary Pougiales	Rochester
Price, William E.	Minneapolis
Prickman, Louis E.	Rochester
Priest, Robert E.	Minneapolis
Priestley, James T.	Rochester
Prim, Joseph A.	Minneapolis
Prins, Leo R.	Albert Lea
Proeschel, Ray K.	Willmar
Proffitt, William E.	Minneapolis
Proshek, Charles E.	Minneapolis
Pruitt, Raymond D.	Rochester
Pugh, David G.	Rochester
Pumala, Erven E.	Warren
Purnell, Don C.	Rochester
Purves, G. Harland	Buffalo
Puumala, Reino H.	Cloquet

Quanstrom, Virgil E.	Brainerd
Quattlebaum, Frank W.	St. Paul
Quello, Robert O. B.	Minneapolis
Quiggle, Arthur B.	Minneapolis
Quist, Henry W., Sr.	Minneapolis
Quist, Henry W., Jr.	Minneapolis

Raadquist, Charles S.	Hibbing
Raattama, John W.	Nashwauk
Raetz, Sylvester J.	Maple Lake
Raile, Richard B.	Minneapolis
Rajala, Arnold I.	Grand Rapids
Ralph, James R.	St. Paul
Ralston, Donald E.	Rochester
Ramlow, Ralph M.	St. Paul
Ramsey, Walter R.	St. Paul
Randall, Lawrence M.	Rochester
Randall, Raymond V.	Rochester
Ransom, H. Robert	Osseo
Ransom, Matthias L.	Hancock
Rasmussen, Ramby C.	St. Paul
Rasmussen, Waldemar C.	Rochester
Ratelle, Alexander E.	Minneapolis
Ravits, Harold G.	St. Paul
Rayner, Ralph R.	Glencoe
Rea, Charles E.	St. Paul
Reader, Donald R.	Minneapolis
Redding, Foster K.	Minneapolis
Reed, Paul	Virginia
Reed, William B.	Rochester
Reff, Alan R.	Crookston
Regnier, Edward A.	Minneapolis
Reid, James W.	So. St. Paul
Reif, Harold A.	Minneapolis
Reif, Henry J.	St. Cloud
Reif, Robert W.	White Bear Lake
Reifsnyder, William Henry, III	Rochester
Reiley, Richard E.	Minneapolis
Reineke, George F.	New Ulm
Reinhardt, James H.	Alexandria
Reitemeier, Richard J.	Rochester
ReMine, William H., Jr.	Rochester
Remole, William D.	Minneapolis
Remsberg, R. R.	Tracy
Reno, George L.	Rochester
Replogle, William H.	Los Angeles, Calif.
Resch, Joseph A.	Minneapolis
Rice, Carl O.	Minneapolis
Rice, Frank B.	Minneapolis
Rice, Fred A.	Minneapolis
Rice, Hagbart G.	Moorhead
Rice, Roberta G.	Minneapolis
Richards, Alhert M.	St. Paul
Richards, Ernest T. F.	St. Paul
Richards, William B.	St. Cloud
Richardson, Edward J., Jr.	St. Paul
Richardson, Robert J.	St. Paul
Richdorf, Lawrence F.	Minneapolis
Richter, David J.	Virginia
Rick, Paul F. W.	St. Paul
Rickman, James H.	Rochester
Rieke, Wellington W.	Wayzata
Rieschl, Elizabeth K.	Jordan
Rigler, Leo G.	Duarte, Calif.
‡ Ringer, Merritt G., Jr.	Rochester
Ringle, Otto F.	Walker
Rinkey, Eugene	St. Paul
Riordan, Elsie M.	Minneapolis
Risch, Ronald E.	Minneapolis
Risser, Alden F.	Stewartville
Ritchie, Wallace P.	St. Paul
Ritt, Albert E.	St. Paul
‡ Ritzinger, Frederick R.	Randolph AFB, Texas
Rizer, Dean K.	Minneapolis
† Rizer, Robert I.	Minneapolis
Roach, Donald E.	St. Paul
Robb, Edwin F.	Minneapolis
† Robbins, Charles P.	Winona
Robbins, Owen F.	Minneapolis
‡ Roberts, Frank E.	Rochester
Roberts, Lewis J.	Minneapolis
Roberts, Oliver W.	Owatonna
Roberts, Stanley E.	Faribault
Roberts, Stanley W.	Minneapolis
† Roberts, William B.	Minneapolis
Robertson, Paul A.	Austin
Robilliard, Charles M.	Faribault
Robinett, Robert W.	Worthington
Robinson, Cortland O.	Minneapolis
† Robinson, Hugh P.	Rochester
Rock, William H.	Anoka
Rocknem, Robert E.	Minneapolis
Rockwell, Curtiss V.	Minneapolis
Rockwood, Philo H.	Fergus Falls
† Rodda, Frederick C.	Minneapolis
Rodgers, Richard S.	Minneapolis
Roehlke, Arthur B.	Elk River
Roemer, Henry J.	Winona
Rogers, Charles W.	Winona
Rogers, Sydney F.	St. Paul
Rogne, William G.	Spring Grove
Roholt, Christian L.	McIntosh
Rohrer, Christian A.	Worthington
* Rokala, Henry E.	Virginia
Rolig, David H.	St. Paul
Rollie, Orris O.	St. Paul
Rollins, Pat	St. Charles
† Rollins, Troy G.	Rochester
Rome, Howard P.	Rochester
Romness, Kenneth B.	Mound
Rooke, E. D.	Rochester
Rorem, Joseph A.	Appleton
*†Rosander, Phyllis	Minneapolis
Rose, John T.	Lakefield
Rosenbaum, David L.	Minneapolis
Rosendahl, Frederick G.	Minneapolis
Rosenfield, Abraham B.	Minneapolis
Rosenow, John H.	Minneapolis
Rosenthal, F. Harold	Austin
Rosenthal, Robert	St. Paul
† Rosenwald, Reuben M.	Anoka
Ross, Alexander J.	Minneapolis
Rossberg, Raymond A.	Morris
Rossen, Ralph X.	Minneapolis
Rotenberg, Robert J.	Minneapolis
Roth, Frederick D.	Mankato
Roth, George C.	St. Paul
Rothnem, Morris S.	Minneapolis
† Rothschild, Harold J.	St. Paul
Rothwell, Walter S.	Rochester
Roust, Henry A.	Montevideo
Rovelstad, Randolph A.	Rochester
Rovelstad, Roger A.	Fairmont
Rowe, Clarence J., Jr.	St. Paul
Rowe, Olin W.	Duluth
Rowles, Everett K.	Coleraine
Roy, Phil C.	St. Paul
Ruchie, Warren H.	Willmar
Rucker, Charles W.	Rochester
Rucker, William H.	Minneapolis
Rud, Norman E.	Minneapolis
† Rudell, Gustave L.	Minneapolis
Rudie, Peter S.	Duluth
Rudie, William D.	Duluth
Rudolph, Frank A.	Sandstone
Ruggles, George M.	Forest Lake
† Ruhberg, George M.	Tarzona, Calif.
Rumpf, Carl W.	Faribault
Runquist, John M.	Duluth
Runquist, Richard K.	Westbrook
Rushton, Joseph G.	Rochester
Russ, Homer H.	Blue Earth
Russeth, Arthur N.	Minneapolis
Rusten, Elmer M.	Minneapolis
Rusterholz, Alan P.	St. Paul
Rutledge, John B.	Detroit Lakes
Rutledge, Lloyd H.	Detroit Lakes
Ryan, John J.	St. Paul
Ryan, Joseph M.	St. Paul
Ryan, Robert F.	Rochester
Ryan, William J.	Duluth
Rydhurg, Wayne C.	Minneapolis
Ryding, Vincent	Albert Lea
‡ Rydland, Arne D.	San Diego, Calif.
Rygh, Harold N.	Atwater
Rynda, Edwin R.	New Prague
Rynearson, Edward H.	Rochester
Rysgaard, George M.	Northfield

St. Cyr, Harry M., Jr.	Rohbinsdale
St. Cyr, Kenneth J.	Robbinsdale
† Sabin, Frederick Chapman	Rochester
Sach-Rowitz, Alvan	Moose Lake
Sadler, William P., Jr.	Minneapolis
Saffert, Cornelius A.	New Ulm
‡ Safirescu, Sorin R.	Minneapolis
Sahr, Walter G.	Hutchinson
Salassa, Robert M.	Rochester
Saliterman, Bernard I.	Minneapolis
Salk, Richard J.	Albany
Salter, Reginald A.	Virginia
Samuelson, Samuel	Minneapolis
Sandeen, Robert M.	Buffalo
Sanderson, David J.	Fergus Falls
Sandt, Karl E.	Minneapolis
† Sandven, Nels O.	Paynesville
† Sanford, Arthur H.	Rochester
† Sanford, John B.	Chicago, Ill
Sanford, Raymond A.	Mankato
Sarff, Oliver E.	Duluth
Sargent, Edward C.	Austin
Sarnecki, M. M.	St. Paul
† Satersmoen, Theodore	Pelican Rapids
Sather, Edgar L.	Fosston
Sather, Edgar R.	Alexandria
Sather, George A.	Fosston
Sather, Richard N.	Fosston
Sather, Russell O.	Crookston
Satterlee, Howard W.	Lewiston
† Satterlund, Victor L.	St. Paul
Sauer, William G.	Rochester
† Savage, Francis J.	St. Paul
Sawaryniuk, Iwan	Waconia
Sawatzky, William A.	Minneapolis
Sawtell, Robert R.	Worthington
Sax, Milton H.	Duluth
Sax, Simon G.	Duluth
Saxman, Gertrude O.	Georgetown
Sayre, George P.	Rochester
Sborov, Abe M.	Minneapolis
Scanlon, Paul W.	Rochester
Schaaf, Frederick H. K.	Minneapolis
Schaar, Frances E.	Minneapolis
Schade, Frederick L.	Worthington
Schaefer, Joseph C.	Rochester
Schaefer, Joseph F.	Owatonna
Schaefer, Kenneth F.	Minneapolis
Schaefer, Wesley G.	Minneapolis
Schaffhausen, Mildred	Minneapolis
Schamber, Walter F.	Parkers Prairie
† Schatz, Francis J.	St. Cloud
Scheidel, Alois McK.	Mankato
Scheifley, Charles H.	Rochester
† Scheldrup, N. H.	Miami, Fla.
Scherer, Leslie Raymond	Minneapolis
Scherling, Sidney S.	Minneapolis
Schiele, Burtrum C.	Minneapolis
Schimelpfenig, George T.	Chaska
Schirber, Martin J.	Grand Rapids
† Schirger, Alexander	Rochester
Schissel, Gregory A.	Minneapolis
Schmid, John F.	Duluth
Schmidt, Herbert W.	Rochester
Schmidt, Hilmar R.	Gloversville, N. Y.
† Schmidt, Paul A.	Aurora, Ill.
Schmidt, Paul G.	Granite Falls
Schmidt, Ruben F.	Alden
Schmidt, W. Robert	Minneapolis
Schmidtke, Reinhardt L.	St. Paul
† Schmitt, S. C.	Los Angeles, Calif.
Schmitz, Anthony A.	Mankato
Schmitz, Glenn P.	Little Falls
Schneck, Jack I.	Waukesha, Wisc.
† Schneider, James A.	Rochester
Schneider, Lawrence E.	Duluth
Schneider, Paul J.	Adams
Schnell, Frederick S.	Litchfield
† Schoch, Robert B. J.	St. Paul
Schoeneberger, P. B.	Perham
† Scholpp, Otto W.	Hutchinson
Scholz, Donald A.	Rochester
Schons, Edward	St. Paul
Sckossow, George W.	Erskine
Schottler, Max E.	Minneapolis
Schreiner, Leon H.	Rochester
† Schroder, Charles H.	Pottstown, Pa.
Schroeckenstein, Hugo F.	St. Paul
Schroeder, Albert J.	Minneapolis
Schroeppel, John E.	Winthrop
† Schuldt, Frederick C.	St. Paul

	Schultz, Alvin L.	Minneapolis
†	Schultz, J. Albert	Albert Lea
	Schultz, J. Harold	Minneapolis
	Schultz, Peter J.	Minneapolis
†	Schulze, Albert G.	St. Paul
	Schulze, William M.	Minneapolis
	Schumacher, John W.	Robbinsdale
	Schut, John W.	Anoka
	Schutz, Elmer S.	Mountain Lake
	Schwartz, E. Robert	Minneapolis
	Schwartz, Virgil J.	Minneapolis
	Schweiger, Theodore R.	Hibbing
	Schwyzer, Arnold G.	St. Paul
	Schwyzer, Hanns C.	St. Paul
	Schwyzer, Marguerite	St. Paul
	Sciarra, Paschal A.	Rochester
	Scimeca, William B.	Rochester
	Scott, Eugene E.	St. Paul
	Scott, Horace G.	Minneapolis
	Scudamore, Harold K.	Rochester
	Seaberg, John A.	Minneapolis
	Seashore, R. T.	Duluth
‡	Seay, James Elbert, III	Big Spring, Texas
‡	Sehrechts, Paul	Great Lakes, Ill.
	Seery, Thomas M.	Austin
	Seham, Max	Minneapolis
	Seifert, Milton H.	Excelsior
	Seifert, Otto J.	New Ulm
	Sekhon, Mohan S.	St. Paul
†	Selby, John B.	Rochester
	Selck, Wolfgang	Minneapolis
	Seldon, Thomas H.	Rochester
•	Seljeskog, S. R.	Minneapolis
	Sells, Richard J.	No. St. Paul
	Selmo, Joseph D.	Norwood
	Semsch, Robert D.	Minneapolis
•†	Senkler, George E.	St. Paul
†	Senn, Edward W.	Owatonna
	Sethre, Arthur E.	Fergus Falls
	Setzer, Hobert J.	St. Paul
	Shandorf, James F.	Minneapolis
	Shannon, William R.	St. Paul
	Shaperman, Eva P.	Minneapolis
	Shapiro, Sidney K.	Minneapolis
	Sharp, David V.	Minneapolis
	Sharpe, Wendell S.	Minneapolis
	Shaver, Ward	Fergus Falls
	Shaw, Howard A.	Minneapolis
	Shea, Andrew W.	Minneapolis
	Sheedy, Chester L.	Austin
	Shelander, Marcus I.	St. Paul
	Sheldon, Warren N.	Loraine, Ohio
†	Shellman, John L.	Pacific Palisades, Cal.
	Sheppard, Charles G.	Hutchinson
	Sher, David A.	Virginia
	Sher, Lewis	Minneapolis
	Sherman, Alfred G.	Albert Lea
	Sherman, Carnot H.	Bayport
	Sherman, Charles L.	Luverne
	Sherman, Lloyd F.	Minneapolis
	Sherman, Royal V.	Red Wing
†	Sherwood, George E.	Kimball
	Shick, Richard M.	Rochester
	Shields, Jack W.	Rochester
	Shillington, Maurice A.	Minneapolis
‡	Shirai, Shohei	Fort Harrison, Indiana
	Short, Jacob	St. Paul
	Shronts, John F.	Minneapolis
‡	Sidell, Franklin D.	Butte, Montana
	Siegel, Clarence	St. Paul
	Siegel, John S.	Virginia
	Siegmann, William C.	Minneapolis
	Siekert, R. G.	Rochester
	Silas, Ralph M.	Minneapolis
‡	Silver, Arthur W.	Southbridge, Mass.
	Silver, John D.	Minneapolis
	Simison, Carl	Barnesville
	Simmonds, Harry N.	Prior Lake
	Simmons, William Henry	Lexington, Ky.
	Simons, Bernard H.	Chaska
	Simons, Edwin J.	Minneapolis
†	Simons, Jalmar H.	Minneapolis
	Simons, Leander T.	St. Paul
	Simonson, Donald B.	Minneapolis
	Simonton, Kinsey MacL.	Rochester
†	Simpson, Ellery D.	Phoenix, Ariz.
	Sinamark, Andrew	Hibbing
	Singer, Benjamin J.	St. Paul
	Sinykin, Melvin B.	Minneapolis
	Siperstein, David M.	Minneapolis
	Sisk, Harvey E.	St. Cloud
	Sisler, Clifford E.	Grand Rapids
	Sisterman, Thomas J.	Minneapolis
†	Sivertsen, Andrew	Minneapolis
*†	Sivertsen, Ivar	Minneapolis
	Sjoding, J. Donald	Mankato
	Sjostrom, Lawrence E.	St. Peter
	Skaife, William F.	Little Falls
	Skaug, Harold M.	Chatfield
	Skinner, Abbott	St. Paul
†	Skinner, Harvey O.	St. Paul
	Skjold, Arthur C.	Minneapolis
	Skogerbee, Rudolph B.	Karlstad
	Slater, Sidney A.	Worthington
	Slocumb, Charles H.	Rochester
	Smid, Arthur C.	Rochester
	Smiley, John T.	Minneapolis
	Smisek, Elmer A.	St. Paul
	Smisek, Frank M.	Minneapolis
	Smith, Adam M.	Minneapolis
	Smith, Archie M.	Minneapolis
	Smith, Baxter A.	Minneapolis
	Smith, Cyril M.	Duluth
	Smith, Donald V.	Blue Earth
†	Smith, Frederick L.	Rochester
	Smith, George R.	Hutchinson
	Smith, Graham G.	Minneapolis
	Smith, Harry J.	Lake Crystal
†	Smith, Harry L.	Rochester
†	Smith, Homer R.	Minneapolis
	Smith, John L.	Rochester
	Smith, Lloyd A.	Willmar
	Smith, Lucian A.	Rochester
†	Smith, Margaret I.	Gardena, Calif.
	Smith, Meredith P.	Rochester
†	Smith, Myron W.	Red Wing
	Smith, Norvin R.	Willmar
	Smith, Paul M.	Lake Crystal
	Smith, Reginald A.	Rochester
	Smith, Ross H., Jr.	Rochester
	Smith, Theodore S.	Minneapolis
	Smith, Vernon D. E.	St. Paul
	Smith, Wallace R.	Grand Marais
	Smith, William G.	Rochester
	Smith, William T.	Minneapolis
	Smorstok, Matthew B.	Monticello
	Smyth, John J.	Lester Prairie
	Snider, Howard R.	Mankato
	Snyder, Clifford D.	Kiester
	Snyder, George W.	St. Paul
	Snyker, Omer E.	Ely
	Soderlind, Ragnar T.	Minneapolis
	Sogge, Ludwig L.	Windom
	Sohlbert, Olof I.	St. Paul
†	Sohmer, A. E. J.	Mankato
	Solhaug, Samuel B., Sr.	Minneapolis
	Solhaug, Samuel B., Jr.	Minneapolis
†	Solsem, Frederick N. S.	Spicer
	Solvason, Harold M.	Minneapolis
	Sommerdorf, Vernon L.	St. Paul
	Sommerness, M. Duane	Fergus Falls
	Sommers, Ben	St. Paul
	Sommerville, Robert L.	Rochester
	Sonnesyn, Nels N.	Le Sueur
	Sontag, David W.	Lake City
	Sorem, Milton B.	St. Paul
	Sorum, F. T.	Willmar
	Soshea, John W.	Rochester
	Soucheray, Philip H.	St. Paul
	Soule, Edward H.	Rochester
	Souster, Benjamin B.	St. Paul
	Sowada, Ernest J.	St. Paul
	Spain, W. Thomas	Princeton, N. J.
	Spang, Anthony J.	Duluth
	Spang, James S.	Duluth
	Spang, William M.	Duluth
	Spano, Joseph P.	Minneapolis
	Spear, Harold C.	New Haven, Conn.
	Spencer, Bernard J.	Minneapolis
†	Sperl, Michael P., Jr.	Rochester
	Spink, Wesley W.	Minneapolis
	Sponsel, Kenath H.	Minneapolis
	Sprafka, Gregory A.	St. Paul
	Sprafka, Joseph L.	St. Paul
	Sprafka, Joseph M.	St. Paul
	Sprague, Randall G.	Rochester
†	Spratt, Charles N.	Minneapolis
	Spurzem, Raymond J.	Anoka
	Stadem, Clifford J.	Twin Valley
	Stahl, George W.	Austin
	Stahler, Paul A.	Jordan
‡	Stahn, Louis H.	Modesto, Calif.
	Stahr, Aubrey C.	Hopkins
	Stam, John	Worthington
	Stanford, Charles E.	Minneapolis
†	Stangl, Philip E.	St. Cloud
	Stanley, Court R.	Minneapolis
	Starekow, Milton D.	Thief River Falls
	Staub, Henry P.	Minneapolis
	Stauffer, Maurice H.	Rochester
	Steffens, Leon A.	Red Wing
†	Stein, Harold A.	Rochester
	Stein, Raymond J.	Pierz
	Stein, William A.	Ely
	Steinberg, Charles L.	St. Paul
‡	Steiner, Leon E.	Philadelphia, Pa.
	Steinhilber, Richard M.	Rochester
	Steinmetz, Rodney D.	Rochester
	Stelter, Lloyd A.	Minneapolis
	Stemsrud, Harold L.	Alexandria
	Stennes, John L.	Minneapolis
	Stensgaard, Kermit L.	Thief River Falls
	Stenstrom, Annette	Minneapolis
	Sterner, Donald C.	St. Paul
	Sterner, E. R.	St. Paul
	Sterner, John J.	St. P
	Sterrie, Norman A.	Minneapo
	Stevens, Grant M.	Roches
	Stevenson, Basil M.	Ful
	Stevenson, Frank W.	Fariba
	Stewart, Alexander	St. P.
	Stewart, Donald E.	Crookst
	Stewart, Marvin J.	Minneapo
	Stewart, Rolla I.	Minneapo
	Stickney, J. Minott	Roches
	Stilwell, George G.	Roches
	Stillwell, George K.	Roches
	Stillwell, Walter C.	Mank
	Stoesser, Albert V.	Minneapo
	Stolpestad, Armer H.	St. P.
	Stolpestad, Herbert L.	St. P.
	Stoltz, Robert C.	Minneapo
†	Stomel, Joseph	Vacaville, Ca
	Stone, Norman F.	Minneapo
	Stone, Stanley P.	Minneapo
	Storsteen, Kenneth A.	Dul
	Storsteen, Oliver M.	Roches
	Stoy, Robert A.	Little F
†	Strachauer, Arthur C.	Minneapo
	Strand, Jack W.	St. P
	Stransky, Theodore W.	Owaton
	Strate, Gordon E.	St. P
	Strathern, Carleton S.	St. Pe
†	Strathern, Fred P.	St. Pe
†	Strathern, Moses L.	Gilb
	Stratte, Alf K.	Pine (
	Stratte, Harold C.	Wind
	Strauchler, Jonas	Belv
	Straus, M. L.	St. P
	Strauss, Eugene C.	Dul
	Street, Bernard	Northfi
	Streitz, John M.	Dul
	Strem, Edward L.	St. P
	Strewler, Gordon J.	Dul
	Strickler, Jacob H.	Minneap
	Strobel, William G.	Dul
	Stroebel, Charles F., Jr.	Roches
	Strom, Gordon W.	Minneapo
	Stromgren, Delph T.	Minneapo
	Stromme, William B.	Minneapo
	Strunk, Clarence A.	Minneapo
	Studer, Donald J.	Fariba
	Stuhler, Louis G.	Roches
	Stuhr, John W.	Stillwa
	Sturges, Robert L.	Minneapo
	Sturley, Rodney F.	St. P.
†	Subhy, Walter	Minneapo
	Sukov, Marvin	Minneapo
	Sullivan, Raymond M.	Minneapo
	Sullivan, Robert E.	Minneapo
	Sutherland, Harry N.	l
	Sutherland, W. H.	New Lond
	Sutton, Harris R.	Hoffm
	Svare, Gerhart T.	Roches
	Svien, Hendrik J.	Roches
	Swain, Francis M.	Minneapo
†	Swanson, John A.	St. P.
	Swanson, Lawrence J.	St. P.
	Swanson, Roy E.	Minneapo
	Swedberg, William A.	Dul
	Swedenburg, Paul A.	Glenwo
	Sweetser, Horatio B.	Minneapo
	Sweetser, Theodore H., Sr.	Minneapo
	Sweetser, Theodore H., Jr.	Minneapo
†	Sweitzer, Samuel E.	Minneapo
†	Swendseen, Carl G.	Minneapo
	Swendson, James J.	St. P.
	Swenson, Arnold O.	Dul
	Swenson, Donald B.	Mank.
	Swenson, Donald B.	St. P.
	Swenson, Orvie J.	Was
	Swenson, Roy G.	North Brar
	Symmonds, Richards E.	Roches
	Syverton, Jerome	Minneap
	Tam, Ernest C.	Minneapo
	Tangen, George M.	Minneapo
	Tani, George T.	St. P
	Tanquist, Edwin J.	Alexand
	Taylor, Joseph H.	Minneapo
	Taylor, William E.	Minneapo
	Teeter, Richard R.	Minneap
	Teich, Kenneth W.	Dul
	Teisberg, John E.	St. P
	Tenner, Robert J.	Minneap
	Terrell, Bernard J.	Nopem
	Tesch, Gordon H.	Elk R
	Tetlie, James P.	Dul
*	Thabes, J. A., Jr.	Brain
	Thayer, Ellsworth A.	Fairm
	Thielen, Robert D.	St. Mich
	Thiem, Chester E.	Mank
	Thill, Leonard J.	Bala
†	Thomas, George E.	Minneapo
	Thomas, John V.	Dul
	Thomas, William H.	Howard La
	Thomes, A. Boyd	Minneapo
	Thompson, Arthur	Minneap

Thompson, A. Henry	Litchfield
Thompson, Carl O.	Hendricks
Thompson, Floyd A.	St. Paul
Thompson, Gershom J.	Rochester
Thompson, Murray C.	Rochester
Thompson, Russell A.	Cosmos
Thompson, Willis H.	Minneapolis
Thomson, James M.	Austin
Thoreson, M. C. Bernice	So. St. Paul
Thorsen, David S.	Minneapolis
Thorson, Stuart V.	Minneapolis
Thouin, Laurence G.	Hibbing
Thuringer, Carl B.	St. Cloud
Thysell, Desmond M.	Minneapolis
Thysell, Fred A.	Moorhead
Thysell, Harold R.	Crookston
Thysell, Vernon D.	Hawley
Tichy, Fae Y.	Pasadena, Calif.
Tifft, Cyril R.	St. Paul
Tillisch, Jan H.	Rochester
Tingdale, August C.	Minneapolis
Tingdale, Carlyle	Hibbing
inkham, Robert G.	Minneapolis
Titrud, Leonard A.	Minneapolis
Tobin, John D.	Minneapolis
Tomhave, Wesley G.	Hibbing
Tongen, Lyle A.	St. Paul
oon, Robert W.	Minneapolis
Torghele, John R.	Hastings
Tosseland, Noel E.	Duluth
Trach, Benedict B.	Minneapolis
Tracht, Robert R.	St. Paul
Traeger, Carl A.	Faribault
Travis, James S.	St. Paul
Traxler, J. Felix	Henderson
Traynor, Mack V., Jr.	Rochester
Tregilgas, Harold R.	So. St. Paul
Tregilgas, Richard B.	St. Paul
Troost, Henry B.	Mankato
Troup, Richard H.	Rochester
Trow, James E.	Minneapolis
Trow, William H.	Minneapolis
Trueman, Harold S.	Minneapolis
Truesdale, Clark W.	Glencoe
Tsai, Shih Hao	Oak Terrace
Tucker, Richard C.	Minneapolis
Tudor, Richard B.	Minneapolis
Tuohy, Edward L.	Santa Barbara, Calif.
Turnacliff, Dale D.	St. Paul
Turner, John C., Jr.	Rochester
Tweedy, John A.	Winona
Tweedy, Robert B.	Winona
Twiggs, Leo F.	Austin
Twomey, John E.	Minneapolis
Ubel, Frank A.	St. Paul
Ude, Walter H.	Minneapolis
Uhley, Charles G.	Crookston
Uihlein, Alfred	Rochester
Ulrich, Christian A.	Rochester
Ulrich, Henry L.	Minneapolis
Ulvestad, Harold S.	Minneapolis
Underdahl. L. O.	Rochester
Undine, Clyde A.	Minneapolis
Updike, Edwin H., II	Rochester
Urberg, Sofus E.	Duluth
Utendorfer, Robert W.	Minneapolis
Utz, David C.	Rochester
Vadheim, Alfred L.	Tyler
Valentine, Walter H.	Tracy
Van Bergen, Frederick H.	Minneapolis
Van Cleve, Horatio P.	Austin
Van Herik, Martin	Rochester
Van Meier, Henry	Stillwater
Van Rooy, George T.	Thief River Falls
Van Ryzin, Donald J.	Duluth
Vandever, Harry W.	Rochester
Varco, Richard L.	St. Paul
Vaughan, Victor M.	Truman
Vaughn, Louis D.	Rochester
Veirs, Dean M.	St. Paul
Veirs, Ruby J. S.	St. Paul
Venables, Alexander E.	St. Paul
Verby, John E.	Rochester
Vermund, Halvor	Minneapolis
Vezina, John C.	Mapleton
Vik, A. Elliott	Minneapolis
Vik, Melvin	Anoka
Virnig, Hildegard	Caledonia
Virnig, Mark P.	Wells
Virnig, Richard P.	Wells
Vitols, T. M.	Minneapolis
Vix, Vernon A.	Worthington
Vogel, Howard A. L.	New Ulm
Vollmer, Frederick J.	Winona
Von Drasek, Joseph	Mankato
Vreeland, Oliver H.	Rochester
Waas, Charles W.	St. Paul
Wagner, Norman W.	Benson
Wagoner, James M.	Harmony
Wahlquist, Harold F.	Minneapolis
Wakefield, Elmer G.	Rochester
Wakim, Khalil G.	Rochester
Walder, Harold J.	Duluth
Waldron, Carl W.	Hopkins
Walfred, Karl A.	St. Cloud
† Walker, A. E.	St. Paul
Walker, Arthur E.	St. Paul
Wall, Carl R.	Minneapolis
Wall, James O.	St. Paul
Wallace, Martin O.	Duluth
† Waller, Joseph D.	Pine City
‡ Wallinga, Jack	Oakland, Calif.
Walonick, Albert L.	St. Louis Park
Walsh, Edward F.	St. Paul
Walsh, Francis M.	Minneapolis
Walsh, William T.	Minneapolis
Walter, Clarence Wm.	St. Paul
Walter, Frederick H.	International Falls
Walter, William E.	Wanamingo
Walters, Waltman	Rochester
Wandke, Otto E.	Fairmont
Wangensteen, Owen H.	Minneapolis
Ward, Louis E.	Rochester
Ward, Percy A.	Minneapolis
Warner, James J.	Perham
Warren, Cecil A.	St. Paul
Wasmund, Clarence W.	Red Wing
Wasson, Loren F.	Alexandria
Waters, Alvin W.	Minneapolis
Watkins, Charles H.	Rochester
Watkins, John A.	Wells
Watkins, Lee C., Jr.	Rochester
Watson, Alexander M.	Royalton
Watson, C. Gordon	Minneapolis
Watson, Cecil J.	Minneapolis
Watson, Eleanor J.	Rochester
Watson, John R.	Rochester
Watson, P. Theodore	St. Paul
† Watson, Percy T.	Miami, Fla.
Watson, Robert M.	Morris
Watson, Sydney Wm.	Royalton
Watson, Virgil A.	Detroit Lakes
Watson, William H. A.	St. Paul
Watson, William J.	Newport
Watz, Clarence E.	St. Paul
Waud, Robert E.	Rochester
Waugh, John M.	Rochester
† Weaver, Myron Mc.	Vancouver, B. C., Canada
Weaver, Paul H.	Faribault
Webb, Edgar A.	Minneapolis
Webb, Roscoe C.	Minneapolis
Webber, Fred L.	St. Paul
Webber, Richard J.	St. Louis Park
Weber, Harry M.	Rochester
Weber, Lowell W.	Minneapolis
Wedes, Deno J.	St. Paul
Weed, Lyle A.	Rochester
Weeks, Richard E.	Rochester
† Weiner, Alan D.	Rochester
Weir, James F.	Rochester
Weis, Benjamin A.	St. Paul
Weisberg, Maurice	St. Paul
Weisberg, Raphael J.	Minneapolis
Weiss, Carl A.	Hastings
Welch, John S.	Rochester
Wellman, William E.	Rochester
Wells, Arthur H.	Duluth
Wells, Walter B.	Jackson
Wendland, John P.	Minneapolis
Wendt, H. Paul	Thief River Falls
Wenner, Waldemar T.	St. Cloud
Wente, Harold A.	Rochester
† Wentworth, Albert J.	Mankato
Wenzel, Gilbert P.	St. Paul
Werner, George	Minneapolis
Wesolowski, Stanley P.	Minneapolis
† West, Catherine C.	Minneapolis
Westby, Magnus	Madison
Westby, Norval M.	Madison
† Westerman, Alvin E.	Montgomery
Westerman, Fred C.	Montgomery
Westover, D. E.	St. Paul
Westrup, John E.	Lanesboro
Wetherby, Macnider	Minneapolis
Wetzel, Earl V.	St. Paul
Wexler, Harold M.	Minneapolis
Wheeler, Daniel W.	Duluth
Wheeler, Robert W.	Minneapolis
Whisnant, Jack Page	Rochester
Whiteacre, John C., II	St. Paul
White, Asher A.	Minneapolis
† White, S. Marx	Minneapolis
White, Willard D.	Minneapolis
Whitesell, Lloyd A.	Minneapolis
Whitson, Sidney A.	Albert Lea
Whittemore, Dexter D.	Bemidji
Widen, Wilford F.	Minneapolis
Wikoff, Howard M.	Crookston
Wilcox, G. Charles	Albert Lea
† Wilder, Kenneth W.	Minneapolis
Wilder, Robert L.	Minneapolis
† Wilder, Russell M.	Rochester
† Wilder, Russell M., Jr.	Minneapolis
Wilken, Paul A.	Minneapolis
*†Wilkinson, Stella L.	St. Paul
† Wilkowske, R. J.	Owatonna
Will, Charles B.	International Falls
Will, W. W.	Bertha
† Willcutt, Clarence E.	Phoenix, Ariz.
Willer, Stanley H.	Rochester
† Williams, Arthur B.	St. Paul
‡ Williams, Bruce F. P.	Duluth
Williams, Charles A.	Pipestone
Williams, Clayton K.	St. Paul
Williams, George E.	St. Paul
Williams, Henry L.	Rochester
† Williams, Hugh O.	Lake Crystal
Williams, John A.	St. Paul
† Williams, Leon A.	Minneapolis
Williams, M. M.	Ah-gwah-ching
Williams, Marland R.	Cannon Falls
Williams, Richard A.	St. Paul Park
† Williams, Robert	New York, N. Y.
Williams, Winfield T.	Fergus Falls
Williamson, Harold A.	Fairmont
Wilmot, Cecil A.	Litchfield
Wilmot, Harold E.	Litchfield
† Wilson, Clyde E.	Blue Earth
Wilson. J. Allen	St. Paul
Wilson, James V.	St. Paul
Wilson, Louis J.	Winona
Wilson, Robert B.	Rochester
Wilson, Robert E.	No. Little Rock, Ark.
Wilson, Rolland H.	Winona
Wilson, Viktor O.	Rochester
Wilson, Warren E.	Northfield
*†Wiltrout, Irving G.	Oslo
Winchell, Paul	Minneapolis
Windesheim, John H.	Rochester
Winge, H. C.	Wheaton
Winn, William E., Jr.	Rochester
† Winnick, Joseph B.	St. Paul
Winter, John A.	Duluth
† Winter, Malcolm D., Jr.	Rochester
Winther, Nora M. C.	Minneapolis
Wipperman, Frederic F.	Minneapolis
Wisness, Osmund A.	Comfrey
† Witham, Carl A.	Minneapolis
Witthaus, Melvyn E.	Mahtomedi
Wittich, Frederick W.	Minneapolis
Wittrock, Louis H.	Watkins
Wohlrabe, Arthur A.	Minneapolis
Wohlrabe, A. Cabot	Minneapolis
Wohlrabe, Clarence F.	North Mankato
Wohlrabe, Edwin J.	Springfield
Wohlrabe, John C.	St. Clair
Wolf, Alfred H.	Minneapolis
Wolff, Herman J.	St. Paul
Wolff, John M.	Duluth
Wolkoff, H. J.	St. Paul
Wollaeger, Eric	Rochester
Wolstan, Simon D.	Minneota
Wolter, Frederick H.	Minneapolis
Woltjen, Myron J.	Rushford
Woltman, Henry Wm. F.	Rochester
† Wood, Harry G.	Rochester
Wood, Lloyd T.	Forest Lake
‡ Woodington, George F.	Altoona, Wisc.
Woodward, Edward, Jr.	Rochester
Woolner, Lewis B.	Rochester
Word, Harlan L.	St. Paul
Workman, Warner G.	Tracy
Woyda, William C.	Elk River
*†Wray, William E.	Campbell
Wright, Robert R.	Austin
Wright, Thomas D.	Minneapolis
Wright, Wale S.	Minneapolis
Wright, William S.	Minneapolis
Wuest, John H.	Rochester
Wyatt, Oswald S.	Minneapolis
Wynne, Herbert M. N.	Minneapolis
Yaeger, Wilbert W.	Marshall
‡ Yamamoto, Joe	Oklahoma City, Okla.
Ylvisaker, Ragnvald S.	Minneapolis
Yoerg, Otto W.	Minneapolis
Young, Henry H.	Rochester
Young, John V. W.	Rochester
Young, Thomas O.	Duluth
Younger, Lewis I.	Winona
Youngren, Everett R.	St. Paul
Yue, Wen Y.	Oak Terrace
Zachman, Albert H.	Melrose
Zachman, Leo L.	St. Paul
Zagaria, James F.	St. Paul
Zahrendt, O. Lewis	Minneapolis
Zarling, V. Richard	Minneapolis
Zaworski, Leo A.	Minneapolis
‡ Zee, Urban H.	Mankato
Zeller, Nicholas H.	New York, N. Y.
Zemke, Erhart E.	Fairmont
Zemmers, Roberts	Duluth
Zierold, Arthur A.	Minneapolis
Zimmer, J. F.	Rochester
† Zimmermann Harry B.	St. Paul
Zinter, Ferdinand A.	Minneapolis
Ziskin, Thomas	Minneapolis
Zupanc, Edward A.	Duluth

General Interest

Minnesota physicians are invited to submit items of "general interest" concerning themselves or their colleagues to MINNESOTA MEDICINE, 2642 University Avenue, St. Paul 14, Minnesota. Only the facts are needed—who? what? where? when? why?—since items are rewritten for uniformity of style.

* * *

Dr. Gordon R. Kamman and attorney **Charles Murnane**, St. Paul, discussed "Medical-Legal Relationships" at a joint meeting of the Southwestern Minnesota Medical Society and Bar Association in Worthington on April 9.

* * *

Principal speaker at the annual banquet of the sixth annual convention of the Student American Medical Association in Chicago on May 5 was **Dr. Walter Judd**, congressman from Minnesota.

* * *

Dr. Raymond C. Read, resident assistant in surgery at the University of Minnesota Hospitals, was one of several faculty members who described "Some Outstanding Achievements of Our University" at a one-day institute on March 17 at the university. Dr. Read discussed advances in heart surgery.

* * *

Dr. Carl Fritsche of New Ulm was elected president of the Brown County Medical Society at an early spring meeting of the group. **Dr. E. J. Wohlrabe**, Springfield, was named vice president, with **Dr. Milton Kaiser**, New Ulm, secretary-treasurer. **Dr. Rolf Hovde**, Winthrop, was selected as delegate with **Dr. J. E. Schroeppel** of Winthrop as alternate.

* * *

An alumni achievement award has been presented to **Dr. Malcolm M. Hargraves**, Rochester, by his alma mater, Ohio State University College of Medicine. Dr. Hargraves, who received his medical degree at the school in 1933, is now a hematology consultant at the Mayo Clinic and an associate professor in the Mayo Foundation.

* * *

Dr. Sidney O. Hughes, Winona, recently received his certification in internal medicine by the American Board of Internal Medicine. Dr. Hughes has been associated with the Winona Clinic for the past two years.

* * *

Dr. E. A. Meyerding, executive secretary of the Minnesota Tuberculosis and Health Association, was presented with the William C. Anderson service award at a meeting of the American Association for Health, Physical Education and Recreation on March 25 in Chicago. The award was made in honor of Dr. Meyerding's work in furthering health education and health services for Minnesota school children.

* * *

Dr. J. V. Carlson and **Dr. Richard Runquist** are now established in a new clinic building, which was recently completed for them at Westbrook.

At the end of March **Dr. and Mrs. Walter A. Fansle** Wayzata, sailed from Jersey City, New Jersey, boun for the Middle East Medical Assembly, which was hel in Beirut, Lebanon, in April. The Fanslers are expecte to return to Minnesota in June.

* * *

Dr. Russell M. Wilder, Rochester, emeritus sta member of the Mayo Clinic, was elected president the National Vitamin Foundation at the annual meetin of the group in New York on March 8.

* * *

Dr. A. W. Graham, Chisholm, has been invited t have an exhibit at the meeting of the American Medic Association at Northwestern University in June. Th exhibit, which was shown at the meeting of the Minne sota State Medical Association last year, presents a stud of blood pressure in children between the ages of fou and eighteen. Information for the study was compile by Dr. Graham over a period of thirty-nine years.

* * *

Dr. Grafton A. Smith, former clinical instructor surgery at the University of Minnesota Medical Schoo has been appointed assistant professor of surgery at th University of Missouri.

* * *

Honorary Minnesota state chairman for Ment Health Week, April 29 to May 5, was **Dr. Charles W** Mayo, Rochester, who was appointed to the post by th Minnesota Association for Mental Health.

* * *

Dr. John Anderson, professor and head of the d partment of pediatrics at the University of Minnesot conducted a clinic at the opening of a new pediatri department at Hibbing General Hospital, Hibbing, o March 24. At an evening dinner meeting he presente a discussion of current advances in pediatrics. The ho pital's new pediatrics department is equipped to hand thirty-two patients, from infants to sixteen-year-old Facilities include isolation rooms, formula preparatio room, recreation room and library.

* * *

Dr. James T. Priestley, Rochester. presented the fir W. Fulton Gillespie Memorial Lecture at a combine meeting of the American College of Surgeons, t Canadian Medical Association and the University Alberta faculty of medicine at Edmonton, Albert Canada, on April 23.

* * *

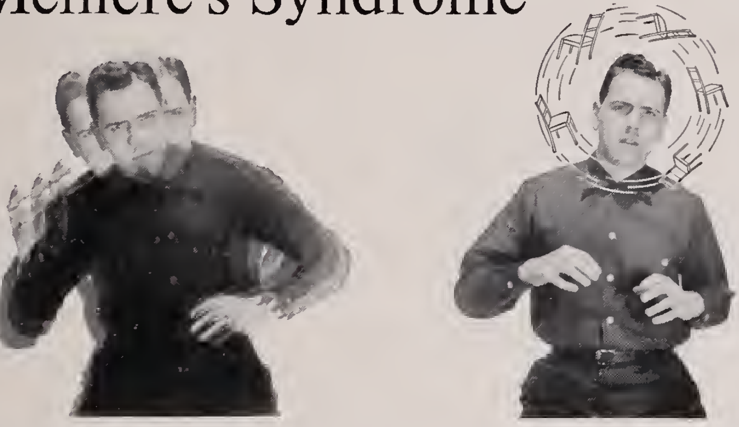
More than 125 physicians from all sections of t country attended an eight-day refresher course cal Mediclinics of Minnesota, which was held at F Lauderdale, Florida, March 5 to 14. Sponsored by t American Academy of General Practice, the course w conducted by a panel of ten instructors from the U versity of Minnesota Medical School. The course w the first of its type to be offered on a national sca

(Continued on Page A-34)

DRAMAMINE® IN VERTIGO

Notes on the Diagnosis and Management of "Dizziness"

III. Ménière's Syndrome



1. Paroxysmal Whirling Vertigo. *This consists of sudden attacks of dizziness, often when the patient is at rest or asleep. The patient may feel that he himself is whirling or that fixed objects about him are whirling. The attack usually lasts for a few minutes; occasionally it is severe for weeks or subacute for months.*

2. Subtotal Hearing Loss. *Deafness will usually affect the high tones and it may be unilateral or bilateral. Sometimes the hearing loss is severe and also progressive.*

3. Tinnitus. *This is usually unilateral and present in the ear with greater hearing loss and is without a definite pattern.*

Fewer diagnostic errors[1] will result if a "triad of symptoms" is required of patients with suspected Ménière's syndrome. These are the symptoms of typical Ménière's syndrome:

1. Severe paroxysmal vertigo which may be of two types; either the patient feels that he is whirling or that objects about him are whirling.
2. Fluctuating subtotal hearing loss, usually affecting the higher tones, is noted at the same time as vertigo.
3. Tinnitus, usually unilateral, is associated with the deafness and dizziness.

With Ménière's syndrome there is no definite localization[2] by the Bárány (vestibular reaction) test and results of the caloric test are not diagnostic. Physical examination should rule out disease of the central nervous or cardiovascular systems before a diagnosis is made.

"Treatment with Dramamine®. . . is effective[3] in aborting and preventing attacks of Ménière's syndrome . . . will prevent or arrest attacks of vertigo. It will also reduce the intensity of the tinnitus and so may save some of the hearing in the affected ear."

Dramamine is recommended for Ménière's syndrome as the sole therapy or in combination with other treatment programs.

It is a therapeutic standard also for motion sickness and is useful for relief of nausea and vomiting of radiation sickness and fenestration procedures.

Dramamine (brand of dimenhydrinate) is supplied in tablets (50 mg.); Supposicones® (100 mg.); ampuls (250 mg.); liquid (12.5 mg. in each 4 cc.). G. D. Searle & Co., Research in the Service of Medicine.

---

1. DeWeese, D. D.: Symposium: Medical Management of Dizziness. The Importance of Accurate Diagnosis, Tr. Am. Acad. Ophth. *58*:694 (Sept.-Oct.) 1954.
2. Jackson, C., and Jackson, C. L. (editors): Diseases of the Nose, Throat, and Ear, Philadelphia, W. B. Saunders Company, 1945, pp. 368; 414.
3. Queries and Minor Notes: Ménière's Syndrome, J.A.M.A., *141*:500 (Oct. 15) 1949.

A new edition of "Dramamine Reviews and Abstracts," containing digests of more than 100 recent articles, is available on request to . . .

SEARLE

P. O. Box 5110, B
Chicago 80, Illinois

slash lubricating costs . . .

use

SURGEL LIQUID

SURGEL
SURGEL

AN
ULMER
PRODUCT

Surgel Liquid cuts costs of lubricating jelly materially. Eliminates the waste which often occurs with tube preparations. Every drop can be used. Free-flowing, esthetic in appearance, Surgel Liquid will not clog the dispenser tip. And a very small amount lubricates a large area.

Surgel Liquid is sterile, too. Each batch is autoclaved. And a special "built-in" disinfectant wards off contamination.

A true "money-saver," Surgel Liquid is the choice in many hospitals, clinics and physicians' offices. Write for your trial supply.

Supplied in pints with special dispenser; also gallons.

MM-556b

Physicians & Hospitals Supply Co.
1400 Harmon Place Minneapolis 3, Minn.

(Continued from Page 358)

The Mediclinics of Minnesota faculty included Dr. H old F. Buchstein, Dr. Harry B. Hall, Dr. Arthur Kerkhof, Dr. Ames W. Naslund, Dr. O. L. Norman N son, Dr. Owen F. Robbins, Dr. Albert V. Stoesser, I Robert J. Tenner, Dr. Richard L. Varco and Dr. Edg A. Webb.

* * *

Dr. F. H. Baumgartner and **Dr. R. J. Salk** now ha their offices in a newly constructed fourteen-room cli building in Albany. The new structure is known as t Albany Medical Center.

* * *

The newly formed **Lay Society of the Twin Cit Diabetes Association** is conducting a membership dr aimed at an estimated 15,000 to 20,000 diabetic pers in the Twin Cities area. The society is an offshoot the medical organization, the Twin Cities Diabetes sociation, and will take over sponsorship of the ann diabetes detection drive which physicians have sp sored in the past. The group will devote its attent to educating the public and diabetic persons about t disease.

* * *

Dr. C. R. Myre and **Dr. R. J. Lindeman** have mo their offices into a new seventeen-room clinic building Paynesville. The one-story structure, which was rece ly completed, measures 46 by 56 feet. Facilities available for a third physician.

* * *

Four new medical consultants have been named the Mayo Clinic staff. They are **Dr. John A. D**, ophthalmology; **Dr. Joseph M. Kiely**, general medici; **Dr. Owings W. Kincaid**, radiology, and **Dr. Don Purnell**, general medicine.

* * *

Six Minnesota scientists recently were awarded a t of $53,000 for cardiac and vascular disease research, cording to an announcement by **Dr. James A. Cosg**, Olivia, president of the Minnesota Heart Associati. The recipients were **Dr. H. Mead Cavert**, **Dr. Hir Kuida** and **Dr. Victor Lorber**, all of the University Minnesota Medical School; **Dr. Alan P. Thal** and **Richard DeWall**, both of University Hospitals, and **Newton C. Birkhead** of the Mayo Foundation, Roches

* * *

Dr. Frederick P. Moersch, special consultant neurology at the Mayo Clinic, Rochester, retired f active service on April 1 after thirty-six years on clinic staff. A graduate of the University of Minne Medical School in 1913, Dr. Moersch joined the M Clinic in 1920. In 1947 he became head of a sec of neurology, which position he held until 1950, w he became a senior consultant. He has been presi of the American Board of Psychiatry and Neurolog member of the council of the American Psychiatric sociation, and vice president of the American Neuro ical Association. Dr. Moersch has contributed m than seventy-eight papers to the literature on neurol and psychiatry and is the author of Neurology Psychiatry for Nurses.

Dr. John R. Watson was recently elected a full part- r in the Olmsted Medical Group, Rochester. Dr. Wat- n has been associated with the group for the past ar. The other partners of the group, **Dr. Harold A.** **ente, Dr. James R. Doyle** and **Dr. John E. Verby,** so appointed **Frank J. Wilkus** of St. Paul as adminis- ator.

* * *

Dr. Robert L. Parker, Rochester, has been named act- g president of the Minnesota Heart Association to place Dr. James Cosgriff, Sr., Olivia, who is on an tended European vacation. An associate professor of edicine for the University of Minnesota, Dr. Parker is ated to become Minnesota Heart Association president r a full term starting in July.

* * *

Dr. Wesley W. Spink, University of Minnesota pro- ssor of medicine, was re-elected on April 19 to a three- ar term on the board of governors of the American ollege of Physicians at its national convention in Los ngeles.

Dr. Spink, who has been the organization's governor r Minnesota for the last three years, will be general airman of the Midwest regional meeting of the Ameri- n College of Physicians, which will be held at the niversity of Minnesota next October. More than 500 ysicians from five states (Illinois, Iowa, Indiana, Wis- nsin and Minnesota) are expected to attend the fall eeting in Mayo Memorial auditorium on the Minne- olis campus.

INNESOTA BLUE CROSS-BLUE SHIELD

As of February 29, 1956, 1,032,482 Minnesotans re covered by Blue Cross through 389,557 contracts compared to 1,003,104 persons enrolled through 378,- 4 contracts as of February 28, 1955. The 1956 total presents a gain of 11,000 effective contracts and ,000 participant subscribers.

Hospitalization activity during the first two months 1956 exceeded that experienced during the same riod of last year. Such activity was over and above at normally attributed to the increase in the number persons protected. During the first two months of 56, hospital care totaling 181,708.5 days was provided 29,571 Blue Cross subscribers; an increase of ap- oximately 19,330 days and 3,600 cases over the previ- s year. Total benefits to subscribers increased nearly 00,000.

Although the average number of hospital days per se has decreased from 6.3 days to 6.1 days, the num- r of cases per year per 1,000 contracts protected in- eased from 412 cases per 1,000 contracts to 456 cases r 1,000 contracts.

Compared to the first two months of 1955, more Blue ross babies were born during the same period during 56. During this period, there were approximately 300 ore maternity cases and increases of subscriber benefits nounted to approximately $72,000.

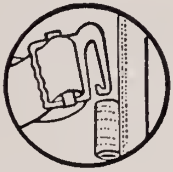
There was a total increase of 468 accident cases dur-

P&H Muller Chest Binder . . .

The only real advance in body bandaging since 1600 A.D. Eliminates body taping . . . does not disturb doctors dressing. Saves nurses' time.

NEW BUCKLE

The key feature of the MULLER surgical binder is the self-locking steel buckle (see detailed sketch below). It is easy to adjust or fasten by either the patient or attendant.



Chest binders are made in both male and female models. Sizes are: Male 36-44, Female 32-44.

MULLER binders are made of units of twilled fabric arranged vertically and stitched to prevent wrinkling. Buckles are not fastened to the garment, thus they can be easily washed to give repeated wear.

A COMPLETE STOCK OF ALL SIZES.

For expert fitting and prompt, courteous service, rely on P & H.

MM-556

PHYSICIANS & HOSPITALS SUPPLY COMPANY

1400 Harmon Place Minneapolis, Minn.

With Sunglasses
Without Sunglasses

Prescribe year-round **eye comfort** for your patients' outdoor activities

More of your patients are spending more of their time out-of-doors than ever before.

As a part of your service of providing complete eye care, we suggest you prescribe sun glasses for year-round eye comfort. Remember, when you do, BENSON's stands ready to give you quick, dependable service from the Upper Midwest's largest and most complete stock . . .

G15 • greens 2 and 3 • full lines of A O Calobars and B & L Ray-Bans . . . regular and large size lenses in hundreds of beautifully styled frames (plain or with precious metal trim). *Many tints available in multifocals.*

Since 1913 Benson OPTICAL COMPANY *Executive Offices • Minneapolis 2, Minn.*

COMPLETE LABORATORIES CONVENIENTLY LOCATED IN UPPER MIDWEST CITIES

ing the first two months of 1956 over the same period in 1955. Increased benefits paid to Blue Cross subscribers totaled nearly $50,000.

Most sizable increase in Blue Cross utilization occurred in the category of respiratory diseases. Nearly 33 per cent of the increase in over-all incidence rate was due to increase in actual respiratory cases; 659 tonsilectomies and 337 medical respiratory cases. Benefits paid exceeded by nearly $85,000 those benefits provided in the same category for the same period in 1955.

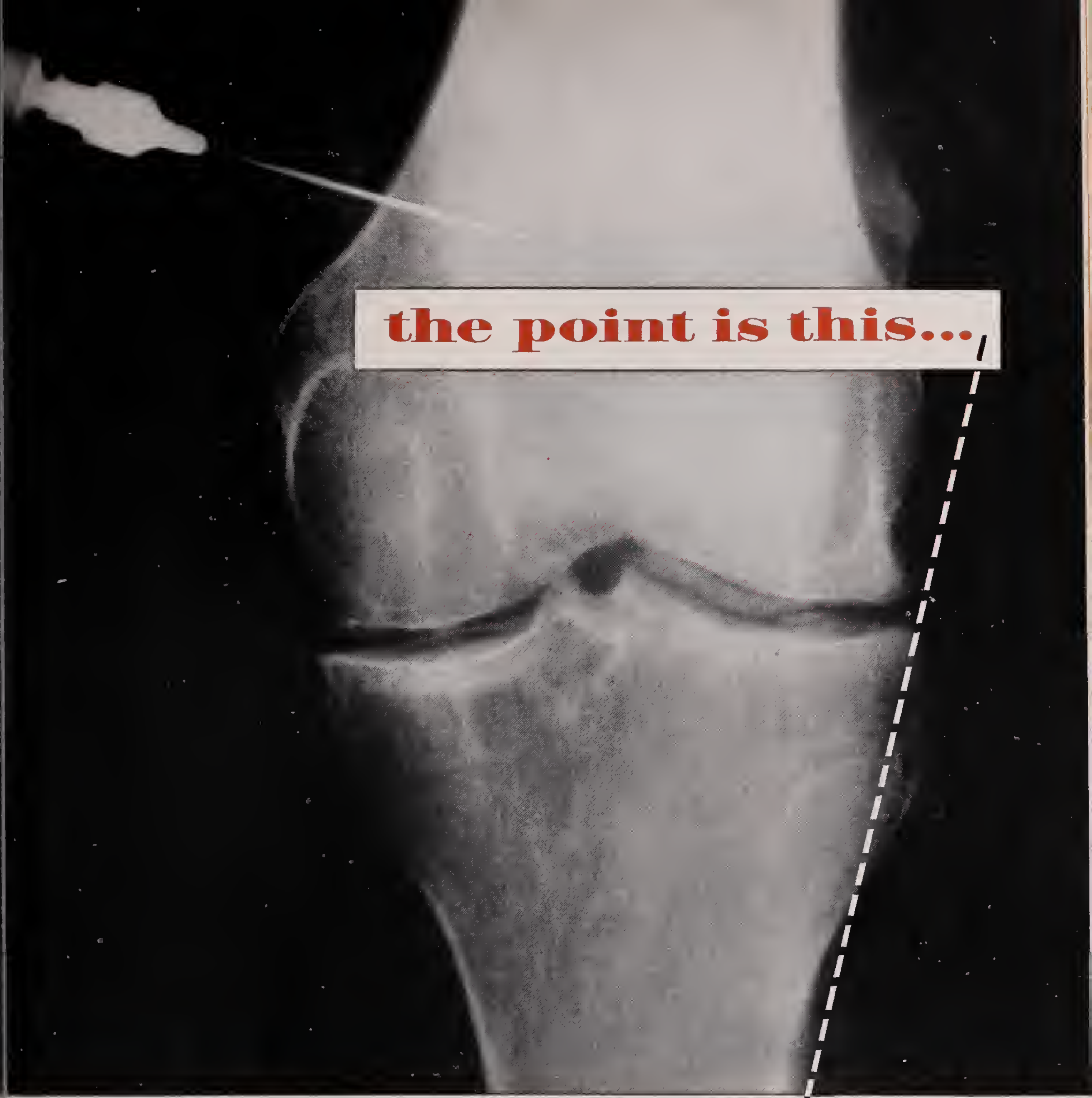
Benefits of nearly $1,050,000 were paid for diseases of the digestive and genitourinary systems during the first two months of 1956. The increase in this category exceeded 200,000.

It should be noted, however, that increases in subscriber benefits not only indicated increases in the number of cases, but also the trend in enrollment toward higher room and board allowance coverage.

As a result of suggestions and requests of physicians located in rural areas of Minnesota, intensive rural enrollment campaigns for both Blue Cross and Blue Shield have been carried out since the first of the year in t St. Cloud, Brainerd, Madison-Dawson and New Ul areas. In addition to these, campaigns are being planne for some ten or twelve other rural locations.

Enrollment results so far accomplished have su passed expectations, principally because of the fine c operation of the hospitals and doctors in the are covered. In each campaign, Blue Cross and Blue Shiel representatives have contacted employed groups throug out the areas, and have been available for group individual discussions of Blue Cross and Blue Shie facts. Information booths have been maintained local hospitals or other community institutions, a newspapers in the areas have been used to inform t people of enrollment opportunities.

With the continued support and co-operation of t hospitals and medical profession, these campaigns w undoubtedly accomplish the purpose for which they a being conducted, which is to make available Blue Cro and Blue Shield enrollment to more people in the rur sections of the state.



HydroCortone® -TBA

(HYDROCORTISONE TERTIARY-BUTYLACETATE, MERCK)

gives the arthritic patient more days of freedom from joint symptoms—in many patients the anti-rheumatic effect persists 2 to 10 times longer than after injection of hydrocortisone acetate. Its action is local and without systemic effect.

SHARP & DOHME

Philadelphia 1, Pa.
DIVISION OF MERCK & CO., INC.

SUPPLIED: SALINE SUSPENSION HYDROCORTONE-TBA—25 MG./CC., VIALS OF 5 CC.

WE CORDIALLY INVITE YOUR INQUIRY for application for membership which affords protection against loss of income from accident and sickness as well as benefits for hospital expenses for you and all your eligible dependents.

APH
OMAHA
APC
OMAHA

the Emblems of RELIABLE PROTECTION

SINCE 1902

ALL PREMIUMS COME FROM

PHYSICIANS
SURGEONS
DENTISTS

ALL BENEFITS GO TO

$4,500,000 ASSETS
$23,800,000 PAID FOR BENEFITS
SINCE ORGANIZATION

PHYSICIANS CASUALTY
AND
HEALTH ASSOCIATIONS
OMAHA 2, NEBRASKA

Book Reviews

Books listed here become the property of the Ramsey, Hennepin and St. Louis County Medical Libraries when reviewed. Members, however, are urged to write reviews of any or every recent book which may be of interest to physicians.

THE TRUTH ABOUT CANCER. Charles S. Cameron M.D. Medical and Scientific Director, American Can cer Society. 268 pages. Illus. Price $4.95, clot Englewood Cliffs, N. J.: Prentice Hall, Inc., 1956.

LABORATORY TESTS IN COMMON USE. Solomo Garb, M.D. Assistant Professor of Clinical Phar macology, Cornell University Medical College. 16 pages. Price $2.00, paper cover. New York: Springe Publishing Co., 1956.

THE ROCHESTER REGIONAL HOSPITAL COUN CIL. Leonard S. Rosenfeld, M.D., M.P.H., an Makover, Henry B., M.D. 204 pages. Price $3.5 cloth. Cambridge, Massachusetts: Harvard Universi Press, for Commonwealth Fund, 1956.

THE BIOLOGIC EFFECTS OF TOBACCO—Wi Emphasis on the Clinical and Experimental Aspect Edited by Ernest L. Wynder, M.D., with a forewor by Joseph Garland, M.D., and the collaboration seven contributors. Pp. 215, cloth, $4.50. Boston an Toronto. Little, Brown and Co., 1955.

As Joseph Garland aptly points out in the forewor "To smoke or not to smoke has become one of the bur ing issues of the day." This book attempts to revie every phase of the evidence on the effect of smoking o health. Each of the authors is an expert in the fie and all have done an excellent job of providing concis balanced summaries of the current knowledge on t subject. The volume is edited by Ernest L. Wynde M.D., who is well known for his investigations on t relationship between smoking and cancer, and includ the following contributions: Chemistry by Alvin Kosak, Ph.D.; Pharmacology by Charles J. Kensle Ph.D.; The Cardiovascular System by Ellen McDevi M.D., and Irving S. Wright, M.D.; Neoplastic Diseas by Ernest L. Wynder, M.D.; The Gastrointestinal Tra by Robert C. Batterman, M.D.; Allergy by Francis Lowell, M.D.; and Cause and Effect by E. Cuyler Har mond, Sc.D.

Since the facts on this subject are developing rapid it is almost impossible to have any book completely to date, but the authors are clear in stating what established facts and what is still open to question. T good bibliography at the end of each chapter, a co bined list of 406 references, and the author and su ject indexes contribute to the reference value. T book is recommended to answer questions of the int ligent layman as well as the physician and resear worker interested in tobacco.

M

MERICAN STANDARD NATIONAL PLUMBING CODE—ASA-A40.8-1955. 186 pages. Price, $3.50. New York: American Society of Mechanical Engineers, 1955.

Public health workers will welcome this small book hich fulfills the need for a code of minimum requireents for plumbing acceptable country-wide. The code the result of a thirty-year effort of governmental, dustrial and organizational representatives, and is sued under the sponsorship of the American Public ealth Association and the American Society of Mechanal Engineers. It should prove a valuable guide to ublic health workers and contractors of municipalities ho are attempting to modernize local plumbing codes.

N OUTLINE OF THE TREATMENT OF FRACTURES. By the Committee on Trauma. 5th rev. ed. 93 pages. Price, $1.00. Chicago: American College of Surgeons, 1954.

The new fifth edition of an outline which has been ighly recommended for twenty-five years brings up to ate most of the pertinent information on the diagnosis nd treatment of fractures. The text is concise, but well ritten and amplifies the excellent illustrations. The racture Aphorisms given throughout the book are an nusual and valuable addition. The bibliography contains utstanding monographs on fractures and injuries.

ARLY CARE OF ACUTE SOFT TISSUE INJURIES. By the Committee on Trauma. 192 pages. Price, $1.00. Chicago: American College of Surgeons, 1954.

The Committee on Trauma of the American College f Surgeons has issued this paper-bound manual dealing ith all trauma exclusive of fractures as a companion ook to "An Outline of the Treatment of Fractures."

This outline is about twice the length of that on fracures and contains twenty-two brief chapters on general rinciples of treatment and first aid of wounds and eparate chapters on the care of injuries of the face, ye, neck, thorax, abdomen, genitourinary tract, soft issues of the extremities and peripheral nerve injuries. dditional chapters on amputations, vascular injuries, urns, management of shock, use of antibiotics and antiera, anesthesia and immunization complete the wide cope covered by this book.

The authors are all distinguished surgeons who have aken considerable time to make this outline highly aluable to all interns, residents and emergency ward taff members. M. C.

REVIEWS OF MEDICAL MOTION PICTURES. Booklet No. 7. Committee on Medical Motion Pictures. Chicago: American Medical Association, 1956.

Booklet No. 7 of Reviews of Medical Motion Pictures, prepared under the supervision of the Committee on Medical Motion Pictures of the American Medical Asociation, contains eighty-three critical reviews of medical and health films which were published in *The Journal AMA* during 1955. A copy has been sent to the secretary of each state medical society and additional copies are available to county medical societies upon request to the committee. Other requests will be filled by the Order Department upon receipt of 25c for Booklet No. 7 or $1.00 for the complete set of seven booklets, including all reviews published since 1946.

EVERY WOMAN

WHO SUFFERS

IN THE

MENOPAUSE

DESERVES

"PREMARIN."

widely used

natural, oral

estrogen

AYERST LABORATORIES
New York, N. Y. • Montreal, Canada
5645

CORRECT CONSTIPATION... RESTORE HABIT TIME OF BOWEL MOVEMENT

PETROGALAR®

Aqueous Suspension of Mineral Oil, Plain

Bottles of 1 Pint

Wyeth
®
Philadelphia 1, Pa.

"...WHEN CONTINUOUS DIURESIS IS MANDATORY TO CONTROL HEART FAILURE, NEOHYDRIN BECOMES THE SUPERIOR [ORAL] AGENT, SINCE THIS COMPOUND CONTINUES TO PRODUCE DIURESIS WHEN ADMINISTERED DAILY"*

*Moyer, J. H., and Hughes, W. M.: J. Chron. Dis. 2:678, 1955.

00656

GLYCAMINE®
TABLETS

For Peptic Ulcers and Hyperacidity

Available All Drug Stores

Distributed by
DALCO PHARMACAL CO.
Minneapolis, Minnesota

THE BANK WHERE YOU FEEL AT HOME

the AMERICAN
NATIONAL BANK OF SAINT PAUL
MEMBER FEDERAL DEPOSIT INSURANCE CORPORATION

HOMEWOOD HOSPITAL is one of the Northwest's outstanding hospitals for the treatment of Nervous Disorders equipped with all the essentials for rendering high-grade service to patient and physician.

Operated in Connection with
Glenwood Hills Hospitals

HOMEWOOD HOSPITAL
Corner Penn and Plymouth Avenues North
Minneapolis Minnesota

The Birches Sanitarium, Inc.

2391 Woodland Avenue
Duluth 3, Minnesota

A hospital for the care and treatment of Nervous and Mental disorders. Quiet, cheerful environment. Specially trained personnel. Recreational and occupational therapy.

Dr. L. R. Gowan, M.D., M.S., Medical Director

The TRAINING SCHOOL
at VINELAND, NEW JERSEY

For Retarded and Slow-Learning Children

Established in 1888 as the "Village of Happiness"; for boys and girls, all ages. Academic, vocational, social training; wide recreation; cottage living; medical, psychiatric, psychologic services. Year-round program. Special Summer Program.

Internationally known research center.

Write Director, The TRAINING SCHOOL at VINELAND, NEW JERSEY. Phone 7-0021

RADIUM RENTAL SERVICE
4340 CEDARWOOD ROAD
MINNEAPOLIS 5, MINNESOTA
TEL. FE 3-5297

Radium element prepared in type of applicator requested

ORDER BY TELEPHONE OR MAIL
PRICES ON REQUEST

Insurance at a Saving

Druggists' Mutual Insurance Company
OF IOWA, ALGONA, IOWA
Fire - Tornado - Automobile Insurance

Prompt Loss Service

MINNESOTA REPRESENTATIVE—S. E. STRUBLE, WYOMING, MINN.

Classified Advertising

Replies to advertisements with key numbers should be mailed in care of MINNESOTA MEDICINE *2642 University Avenue, Saint Paul 14, Minnesota.*

WANTED—Young General Practitioner, also young Internist to join small group consisting of Pediatrician, General Practitioner and General Surgeon in Minneapolis. Building is entirely new and designed for group practice. Address E-504, care MINNESOTA MEDICINE.

WANTED—General practitioner for State Hospital. Salary range $641 to $781 per month. Quarters available, subsistence, laundry, and garage. Government working conditions, paid holidays, vacation, sick leave, and retirement pension plan. Write Superintendent, Fergus Falls State Hospital, Fergus Falls, Minnesota.

PHYSICIAN WANTED—In Southern Minnesota town. Address Grand Meadow Health Association, Grand Meadow, Minnesota.

WANTED—Associate in general practice. Excellent office, housing, schools, and hospital facilities. Early partnership. Twenty-five miles northwest of Minneapolis. R. D. Thielen, M.D., St. Michael, Minnesota.

WANTED—Assistant or associate in general practice, by two associated general practitioners in prosperous central Minnesota town. New hospital and excellent facilities. Prefer associate with some special training or experience. Please state qualifications and ambitions in application. Write E-522, care of MINNESOTA MEDICINE.

WANTED—Assistant in General Practice in Central Minnesota. Prosperous community—good hunting and fishing. New 32-bed hospital. Address E-514, care MINNESOTA MEDICINE.

WANTED—General practitioner to associate with group in Northern Minnesota in heart of new iron ore development. Rapidly enlarging population. Partnership after one year. Contact: D. J. Richter, M.D., East Range Clinic, Virginia, Minnesota.

WANTED—General practitioner to replace present doctor leaving to specialize. Unopposed practice with excellent immediate income. Address E-518, care MINNESOTA MEDICINE.

WANTED—Board-certified or board-elegible ophthalmologist. Group of thirteen doctors in small midwest community. Liberal starting salary and partnership after one year. Address E-525, care MINNESOTA MEDICINE.

PLACEMENT SERVICE

The Minnesota State Medical Association maintains a Medical Placement Service for the benefit of physicians who are looking for locations and positions; also for communities, medical groups and physicians who are looking for licensed medical assistance. For information, write to the Minnesota State Medical Association, 496 Lowry Medical Arts Bldg., Saint Paul 2, Minnesota.

AVAILABLE August 1, young general practitioner for locum tenens or temporary association. Write E-519, care MINNESOTA MEDICINE.

LOCUM TENENS—Physician's services required until July, 1957, Northwestern Minnesota. Lucrative general and surgical practice. Equipped office near community hospital available on rental basis. Immediate income. Possible purchase later. Address E-527, care MINNESOTA MEDICINE.

MODERN MEDICAL CLINIC, in Upper Peninsula of Michigan, is seeking services of Ophthalmologist or Ophthalmologist-Otolaryngologist or Doctor of Medicine capable of prescribing eyeglasses. Optician and modern eye shop associated in this clinic. Address E-520, care MINNESOTA MEDICINE.

LARGE NATIONALLY KNOWN INDUSTRIAL CONCERN has opening for general practitioner, recent medical graduate, or one desiring to enter the industrial field. Complete modern Medical Department, no Saturday or Sunday work, paid holidays, vacations, sick leave, and pension plan. Fine opportunity for right man in town of 18,000, near Twin Cities. Address E-531, care MINNESOTA MEDICINE.

WANTED—Residents in Psychiatry. Opportunity for beginning and advanced candidates in five-year Minnesota State Program offered in collaboration with University of Minnesota and Mayo Foundation. Must be acceptable to above training centers. Stipends $5,000 to $7,000. Direct reply to Dale C. Cameron, M.D., Medical Director, Minnesota State Department Welfare, 117 University Avenue, Saint Paul 1, Minnesota, giving full information about training and experience.

WANTED—Superintendent-Manager, District Tuberculosis Sanatorium, Southwestern Minnesota. Agricultural town 8000. Modern residence. Requires training in tuberculosis control and preventive medicine, supervision District Tuberculosis control program. Salary open. Address E-517, care MINNESOTA MEDICINE.

WANTED—General practitioner to become associated with established clinic in West Central Minnesota town of 2600 and surrounding 20-mile radius area. Should preferably have enough surgical training to do routine operations and bone work. Address E-529, care MINNESOTA MEDICINE.

P SITION OPEN—For medical technologist, ASCP.
xcellent working conditions in new building. Top
alary. Inquire of G. Albin Matson, Ph.D., Minneap-
lis War Memorial Blood Bank. 1914 LaSalle Avenue,
inneapolis, Minnesota

F R RENT—New, attractive, doctors' office available
suburban Minneapolis shopping center. Low
ntal. Several suites to choose. Contact, call or
rite Mr. Novich, 2200 Hennepin Avenue, Minne-
polis. Telephone FRanklin 7-6599.

A TENTION DENTISTS AND DOCTORS—Modern
ace available for dentists' and doctors' offices. A
cation where several sets of doctors and dentists
ave been long established and then built their own
inics. A money maker. Above Kisch's Food Market.
lenty of auto parking space. Apply 637 Stryker
venue, Saint Paul, Minnesota.

F R RENT OR SALE—Eight-room, first-floor physi-
ian's office. Well equipped. Near Twin Cities. Gross
ver $30,000. New hospital—unlimited privileges.
ood opportunity. Write E-511, care MINNESOTA
EDICINE.

R RENT—Highland Shopping Area, equipped office
vailable, full or part time. Share with surgeon and
entist. Excellent for general practice, obstetrics,
ediatrics. No equipment necessary; no rent until
stablished. H. Schwyzer, M.D., 2069 Ford Parkway,
aint Paul. Telephone: MI 8-4832 or CA 4-7416.

R SALE—General practice established thirty-three
ears, excellent hospital facilities near by. Reason
etiring. T. A. Clifton, M.D., Chatfield, Minnesota.

CTOR OR DENTIST—Beautiful suite in South
inneapolis. Very modern. Six months free rent. Then
ption of lease at very reasonable rent. Wm. L.
ochrane, 4101 - 42nd Avenue South, Minneapolis,
innesota. Telephone Ro 9-8758.

R RENT—Four connecting rooms with private hall
nd large waiting room shared by successful M.D.—
50 per month. Building has elevator, faces main
treet; occupied by only professional men for past
hirty years. Apply to E. J. Webber Company, Fergus
alls, Minnesota.

R RENT—Office space in new AOUW Building,
706 W. Seventh Boulevard at Edgecumbe Road,
djacent to new Remington Rand Building. Rooms
ir conditioned, sound proof. Large housing develop-
nent in progress. Excellent location for physician or
entist. Street entrance. Unlimited parking facilities.
all or write Dr. Berenice Moriarty at above address.
elephone MIdway 9-6681.

CLINIC LOCATION—For sale or will improve on lease. Two lots comprising 80 x 120 feet at 1398 West Seventh Street, Saint Paul. Address Thos. F. Ryan, 1227 Birmingham, Saint Paul, Minn. Telephone evenings VIctor 4-1842.

FOR RENT—Medical Building in Hillcrest Shopping Center now completed. Two-thirds of medical offices occupied. Three suites still available. Building modernly equipped with convenient facilities, air-conditioning, ample parking and centrally located in Northwest's fastest growing center. Adjacent to Snyder's Drug Store. Fills more prescriptions per day than any other drug store in Saint Paul. Approximately 75,000 residents serviced by Hillcrest Center. Call or write Hillcrest Development, 1457 University Avenue, Saint Paul, Minnesota. MIdway 5-5829.

GROUND FLOOR OFFICE FOR RENT—Three rooms and reception room to be shared with a dentist and M.D. Ideal for pediatrician or general practitioner. Located in Southern Minnesota county seat of 30,000. Write P.O. Box 266, Austin, Minnesota.

WANTED—Used equipment. Two men starting General Practice need complete office equipment and instruments. Write T. E. Vanderpool, M.D., 69 Saint Mary's Avenue, S.E., Minneapolis 14, Minnesota.

FOR SALE—Lots of books and instruments, mostly EENT, trial case and lenses, Vols. 1 to 4 Duke-Elder, microscope and electric centrifuge, anatomical specimens, et cetera. Address E-528, care MINNESOTA MEDICINE.

FOR SALE—Entire office equipment including Allison table, Castle sterilizer, surgical instruments; also eight Globe Wernicke sectional bookcase. T. A. Clifton, M.D., Chatfield, Minnesota.

FOR SALE—ZEISS IKON MICROSCOPE stand w. Brand new. Cost price $1,476; will sacrifice for $700.00. Well equipped. Binocular, four objectives, optovar, two-phase contrast, et cetera. Address Rainer Stiewe, 273 Dayton Avenue, Saint Paul 2, Minnesota. Telephone CApitol 5-3690.

FOR SALE—60 ma Westinghouse Shockproof X-ray. Tilting table and fluoroscopy tube and screen. $500 worth of accessories. Ideal machine for office use. First $1,000 takes it, cash or terms, f.o.b. Duluth. Address E-505, care MINNESOTA MEDICINE.

FOR SALE—General practice in county seat town, central Minnesota. Gross over $40,000 annually. Practice, records, equipment, drugs, and accounts, $20,000. Address E-530, care MINNESOTA MEDICINE.

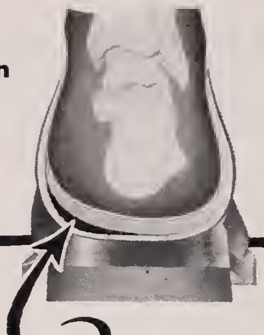
DANIELSON MEDICAL ARTS PHARMACY, INC.

PHONES:
FEderal 3-3317
FEderal 3-3318

10-14 Arcade, Medical Arts Building
825 Nicollet Avenue—Two Entrances—78 South Ninth Street
MINNEAPOLIS

HOURS:
WEEK DAYS—8 to 7
SUN. & HOL.—10 to 1

Foot-so-Port Shoe Construction and its Relation to Weight Distribution



- Insole extension and wedge at inner corner of heel where support is most needed.
- Special Supreme rubber heels are longer than most anatomic heels and maintain the appearance of normal shoes.
- The patented arch support construction is guaranteed not to break down.
- Innersoles are guaranteed not to crack, curl, or collapse. Insulated by a special layer of Texon which also cushions firmly and uniformly.
- Foot-so-Port lasts were designed and the shoe construction engineered with orthopedic advice.

NOW AVAILABLE! Men's conductive shoes. N.B.F.U. specifications. For surgeons and operating room personnel.

- By a special process, using plastic positive casts of feet, we make more custom shoes for polio, club feet and all types of abnormal feet than any other manufacturer.

Write for details or contact your local **FOOT-SO-PORT** *Shoe Agency. Refer to your Classified Directory*

Foot-so-Port Shoe Company, Oconomowoc, Wis.

"...THE MERCURIALS HAVE PROLONGED THE WORKING PERIOD AND LIFE SPAN OF COUNTLESS SUFFERERS FROM CONGESTIVE HEART FAILURE..."*

TABLET
NEOHYDRIN®

*Fishberg, A. M.: Hypertension and Nephritis, ed. 5, Philadelphia, Lea & Febiger, 1954, pp. 177-178.

00756

RELIABILITY!

For years we have maintained the highest standards of quality, expert workmanship and exacting conformity to professional specifications . . . a service appreciated by physicians and their patients.

ARTIFICIAL LIMBS, TRUSSES,
ORTHOPEDIC APPLIANCES,
SUPPORTERS, ELASTIC HOSIERY

Prompt, painstaking service

Buchstein-Medcalf Co.
223 So. 6th St. Minneapolis 2, Minn.

RADIUM

(Including Radium Applicators)
FOR ALL MEDICAL PURPOSES
Est. 1919

Quincy X-Ray and Radium Laboratories

(Owned and Directed by a Physician-Radiologist)

HAROLD SWANBERG, B.S., M.D.
Director
W. C. U. Bldg. Quincy, Illinois

Confidential Placement Service for Physicians

The Medical Placement Registry has numerous opportunities for GENERAL PRACTITIONERS and BOARD MEN in all Specialties. . . .

Visit us in Booth 17 at the Rochester Meeting
May 21-23

Medical Placement Registry
1016 Medical Arts Building, Minneapolis
and
Kahler Arcade, Rochester

GYNECOLOGIC CYTOLOGY SERVICE

Interpretation of Cervico-Vaginal, Etc. (Papanicolaou) Smears
for the
Diagnosis of Carcinoma

Kits (Slides, Spatulas, Fixative and Mailing Containers)
and
Instructions for Taking and Mailing Smears furnished on request

M. WM. RUBENSTEIN, M.D.
GYNE-CYTOLOGY LABORATORY
636 Church Street, Room 517 Evanston, Illinois

Upjohn
KALAMAZOO

Indicated in most conditions in which oral cortisone or hydrocortisone is effective • Available in 1 mg. and 2.5 mg. tablets in bottles of 100, and in 5 mg tablets in bottles of 30, 100, and 500 • Usual dosage is ½ to 1 tablet three or four times daily

Delta-Cortef*

requires only 1/3 the dose of hydrocortisone

*Trademark for the Upjohn brand of prednisolone (delta-l-hydrocortisone)

NEW!
Patented HANSEN
Split Frame Truss

Positive Hernia Control

Contoured Spring Design Gives
Custom Made Comfort
Unlimited Body Activity

Single with Dummy illustrated
Double not illustrated

C. F. ANDERSON CO., INC.

901 Marquette
Minneapolis, Minnesota

THE
MEDICAL PROTECTIVE
COMPANY
FORT WAYNE, INDIANA

unique
in successfully fighting
malpractice charges

**PROFESSIONAL PROTECTION
EXCLUSIVELY
SINCE 1899**

MINNEAPOLIS Office:
Robert L. McFerran and
John Hansel, Representatives
311 East 24th St., Apt. A-1
Telephone Federal 9-1292

A more complete gall bladder regimen in a single tablet...

Colicell

Each Tite-Coat Red Tablet Contains:

Extracts of Whole Bile (Equal parts Ox and Hog)....210.0 mg.
Ketocholanic Acids (Oxidized or keto form of normally occurring bile acids containing approximately 93% dehydrocholic acid)....90.0 mg.
Methyl Cellulose....130.0 mg.
Homotropine Methylbromide....2.5 mg.

(In bottles of 100 and 1000 tablets.)

- *more effective . . . for a longer period of time*
- *specially coated to prevent gastric disturbance*
- *lower cost than most bile acid preparations that have only a single purpose*

SAMPLES AND LITERATURE ON REQUEST
SUTLIFF & CASE CO., INC.
Pharmaceutical Specialties
PEORIA, ILLINOIS

Index to Advertisers

Aloe, A. S., Co. A-26
American Meat Institute .... Cover III
American National Bank of Saint Paul A-40
Anderson, C. F., Co., Inc. A-45
Ayerst Laboratories A-39

Bayer Co. Division A-12
Benson, N. P., Optical Co. A-36
Birches Sanitarium, Inc. A-41
Brown & Day, Inc. A-30
Buchstein-Medcalf Co. A-44
Burroughs Wellcome & Co. A-22

Caswell-Ross Agency 302-A
Ciba A-28
Classified Advertising A-42, A-43
Cook County Graduate School of Medicine A-30

Dalco Pharmacal Co. A-40
Danielson Medical Arts Pharmacy, Inc. A-43
Druggists Mutual Insurance Co. A-41

Foot-so-Port Shoe Co. A-44

Globe, Inc. A-24
Gyne-Cytology Laboratories A-44

Hazelden Foundation A-30
Hoffmann-La Roche .... Facing page A-24
Homewood Hospital A-41

Juran & Moody, Inc. 302-D

Knox, Chas. B., Co., Inc. A-23

Lakeside Laboratories (Neohydrin) A-31, A-40, A-44
Lederle Laboratories 302-B, 302-C
Lilly, Eli, & Co. .... Cover I, A-32

Mead Johnson & Co. A-2
Medical Placement Registry A-4
Medical Protective Co. A-4

Parke, Davis & Co. .... Cover II, A-1, A-8, A-
Pfizer Laboratories, Div.
  Chas. Pfizer & Co. A-13, A-1
Physicians Casualty & Health Associations A-3
Physicians & Hospitals Supply Co. A-34, A-3
Professional Credit Protective Bureau .... A-

Quincy X-Ray and Radium Laboratories A-4

Radium Rental Service A-4

St. Croixdale Sanitarium A-2
St. Paul Fire & Marine Insurance Co. A-2
Schering Corporation .... A-16, Insert facing A-1
  A-19, A-2
Searle, G. D., & Co. A-3
Sharp & Dohme A-6, A-7, A-15, A-29, A-3
Smith, Kline & French Laboratories .... Cover I
Squibb A-2
Sutliff & Case Co., Inc. A-4

Training School at Vineland, N. J. A-4

Upjohn .... A-11, A-
U. S. Vitamin Corporation A-1

Viceroy Cigarettes .... A-

Wallace Laboratories .... A
Winthrop Laboratories .... A-
Wyeth, Inc. .... A-21. A-

Meat...

and the Rehabilitation of Protein Depleted Patients

Although the recommended daily allowance of one gram of protein per kilogram of body weight is adequate for the average healthy adult,[1] greater amounts may be needed in the rehabilitation of patients depleted in protein after severe infections, mechanical trauma, burns, or extensive surgery.[2] Protein needs for tissue regeneration during convalescence are high.

To speed rehabilitation of the protein depleted patient, top quality protein and calories should be given in generous quantity.[2] However, a high protein intake, 130 grams daily, at best induces a slow response.[3] Intakes at 3 or 4 times that level may produce considerably more rapid gain in weight, strength, and morale.[4,5] If mastication and swallowing are difficult, canned strained meats—such as used in infant feeding—may be used to advantage in the high protein diet.[2]

Lean meat, outstanding in contained top quality protein, may well be made the keystone of the high protein diet. Its abundance of vitamin B complex and essential minerals—iron, phosphorus, potassium, and magnesium—adds to its therapeutic value. Important also are its appetite appeal, its easy digestibility, and its virtual freedom from allergenic properties.

---

1. Recommended Dietary Allowances, Washington, D. C., National Academy of Sciences—National Research Council, Publication 302, 1953.
2. Co Tui: Review: The Fundamentals of Clinical Proteinology, J. Clin. Nutrition *1*:232 (Mar.-Apr.) 1953.
3. Keys, A.; Brozek, J.; Henschel, A.; Mickelsen, O., and Taylor, H. L.: The Biology of Human Starvation, Minneapolis, Univ. of Minnesota Press, 1950.
4. Burger, G.C.E.; Drummond, J.C., and Sandstead, H.R.: Malnutrition and Starvation in Western Netherlands, The Hague General State Printing Office, 1948, Part II, p. 91.
5. Co Tui; Kuo, N.H.; Chuachiaco, M., and Mulholland, J.H.: The Protein Depletion (Hypoproteinia) Syndrome and Its Response to Hyper-Proteinization, Anesth. & Analg. *28*:1 (Jan.-Feb.) 1949.

The nutritional statements made in this advertisement have been reviewed by the Council on Foods and Nutrition of the American Medical Association and found consistent with current authoritative medical opinion.

American Meat Institute
Main Office, Chicago...Members Throughout the United States

to help you relieve

the severe emotional upset

of the menopausal patient

THORAZINE*

'Thorazine' can facilitate the over-all management of your menopausal patient. Its unique, non-hypnotic tranquilizing effect relieves anxiety, tension, agitated depression and helps you to restore to the patient a feeling of well-being and a sense of belonging.

'Thorazine' is available in ampuls, tablets and syrup (as the hydrochloride), and in suppositories (as the base).

'Thorazine' should be administered discriminately and, before prescribing, the physician should be fully conversant with the available literature.

For information write:

Smith, Kline & French
Laboratories, Philadelphia 1

*T.M. Reg. U.S. Pat. Off. for chlorpromazine, S.K.F.

Northern Minnesota Medical Association, Alexandria.
September 7 and 8, 1956

COLLEGE OF PHYSICIANS
LIBRARY
SEP 26 1956
PHILADELPHIA

Minnesota MEDICINE

PUBLISHED MONTHLY BY THE MINNESOTA STATE MEDICAL ASSOCIATION

Volume 39 JUNE, 1956 Number 6

Printed in U.S.A. (Table of Contents—Pages A-2 and A-3) 40c a copy—$3.00 a year

Fastest and shortest-acting oral barbiturate

'Seconal Sodium'
(SECOBARBITAL SODIUM, LILLY)

Among its many uses:
- Simple insomnia
- Unruly pediatric patients
- Obstetric patients
- Procedures associated with moderate pain

In 1/2, 3/4, and 1 1/2-grain pulvules and in ampoules, suppositories, and 'Enseals' (Timed Disintegrating Tablets, Lilly); also, Elixir 'Seconal' (Secobarbital, Lilly).

Lilly

Volume 39
Number 6

Minnesot

Contents f

SCIENTIFIC ARTICLES

ORIGINAL CONTRIBUTIONS

Differential Diagnosis of Acute Poliomyelitis—A Four year Study of 717 Cases of Suspect Poliomyelitis.
T. C. Papermaster, M.D., Minneapolis, Minnesota.... 359

Function of the Endocrine Organs during the Postoperative Period.
E. Dahl-Iversen, Copenhagen, Denmark 365

Cervical Traction and Other Physical Therapeutic Procedures for Pain about the Neck and Shoulders.
Donald J. Erickson, M.D., Rochester, Minnesota........ 373

Arteriography as an Aid to Diagnosis.
Einer W. Johnson, Jr., M.D., Rochester, Minnesota.... 378

Minnesota Maternal Mortality Study for 1953.
Minnesota Maternal Mortality Study Committee........ 381

Radioiodine Uptake in the Diagnosis of Thyroiditis.
Elmer C. Paulson, M.D., Saint Paul, Minnesota 387

Congenital Peripheral Arteriovenous Communications.
Thomas O. Murphy, M.D., Sol Sandhaus, B.S., and *Joseph M. Ryan, M.D., F.A.C.P.*, Minneapolis and Saint Paul, Minnesota 389

Accidents of Children.
Arthur C. Smid, M.D., and *George B. Logan, M.D.*, Rochester, Minnesota 392

CASE PRESENTATION

Transitional Hydatidiform Mole with Fulminating Pre-Eclampsia and a Macerated Fetus.
Francis M. Swain, M.D., Minneapolis, Minnesota

SEMINAR

The Pyrrol Pigments and Hemoglobin Catabolism. *(Continued from May issue)*
C. J. Watson, M.D., Minneapolis, Minnesota . .

CONTINUATION STUDIES

The Diagnostic Usefulness of Peritoneoscopy.
James B. Carey, Jr., M.D., Minneapolis, Minnesota

CURRENT CARDIAC CONCEPTS

Lymphedema.
B. F. Fuller, M.D., and *H. W. Johnson, M.D.*, Saint Paul, Minnesota ....

CLINICAL NOTES

Xylocaine Jelly for Topical Urethral Anesthesia.
E. A. Webb, M.D., B. A. Smith, M.D., and *W. Price, M.D.*, Minneapolis, Minnesota ....

* * *

Official Journal of

Duluth Surgical Society
Minneapolis Academy of Medicine
Minneapolis Obstetrical and Gynecological Society
Minneapolis Surgical Society
Minnesota Academy of Medicine
Minnesota Obstetric and Gynecologic Society

Owner and Publisher

Published by MINNESOTA STATE MEDICAL ASSOCIATION
496 Lowry Medical Arts Building
St. Paul 2, Minnesota

Editing and Publishing Committee

E. M. Hammes, M.D.
Chairman, Saint Paul
F. M. Owens, Jr., M.D.
Saint Paul
T. A. Peppard, M.D.
Minneapolis
Henry Ulrich, M.D.
Minneapolis

Business Manager

R. R. Rosell
496 Lowry Medical Arts Building
St. Paul 2, Minnesota

GEN

Authors

Manuscripts should be addressed to Arthur H. Wells, M.D., Editor, 915 Eas
Street, Duluth 5, Minnesota. Telephone RA 7-6636 or JA 5-2319. Original papers p
for publication solely in MINNESOTA MEDICINE will be considered by the Board of
providing they fulfill the following editorial standards. Manuscripts should be
double spaced on white paper with at least 1-inch margins. The original (not a
copy) is requested. The title on the first page should be under six words if
or divided into two parts. The author should give his highest degree, his insti
position or his relationship to a hospital or medical organization which he
addressing. Pages should be numbered consecutively and the author's last name
appear at the top of each page after the first page.

Biographical references should appear on a separate sheet entitled "Bibliography.'
should appear and be numbered consecutively in the order in which they first
the text (not alphabetically). Citations in the text require reference numbers
author's or authors' names are not used or if there is more than one reference
same author or group of authors. All references to author should appear
Bibliography and no references should be included which are not in the text. T
and exact punctuation used in the J.A.M.A. references is requested. For a journal
Author's last name, initial, initial.: title of paper. Abbreviated name of journal,
number: page, year. Book references should give author, title, edition numbe
publisher and year.

Illustrations (photographs, tables and graphs) should be submitted separately a
combined in the text. There should be a separate sheet entitled "Illustrations"
contains the various types of illustrations listed separately and numbered in th

edicine

ue, 1956

Volume 39
Number 6

MISCELLANEOUS ARTICLES

RIALS

ntribution of Clinical Psychology to chosomatic Medicine 418
ocardiography: Use and Misuse 418
ashier's Check and Bank Draft 419
ature of Alcoholism 420
istory of Glass Containers 420
sion: Everything for Everybody? 421
n Penology 422
ilitation in Pulmonary Tuberculosis 422
n 423

DENT'S LETTER

ians and Social Security 424

AL ECONOMICS

Foundation Gives $10 Million to Funds for lical Schools 426
Hospital Costs Are High 426
American Medical Directory Completed 426
Speaks at SAMA Meeting 426
Committee Approves Two Health Bills 427
Measures May Affect Aged 427
ersion of Alaskan Mental Health Bill Proposed 427
of Civil Aviation Medicine Proposed 427
U. S. Warns Public Against Hoxsey Cancer Treatment 427
Military Medical Legislation Bills Go Through House 427
Fee Complaints Not Necessarily Based on Fees 428
AMA Law Department Sponsors Meeting 428
Medical Assistance Bills Introduced 428
Commissions for Osteopaths Still in Doubt 428
Government Investigates Abuses in VA Outpatient Program 428

IN MEMORIAM

William H. Condit 429
Everett C. Hartley 429
Paul A. Higbee 429
Rufus O. Johnston 429
Henry W. Noth 429
Homer M. McIntire 429

MEETINGS AND ANNOUNCEMENTS 430
GENERAL INTEREST 432
BOOK REVIEWS A-32
CLASSIFIED ADVERTISING A-40
INDEX TO ADVERTISERS A-41

esota Society of Clinical Pathologists
esota Society of Internal Medicine
esota Society of Neurology and Psychiatry

Minnesota State Medical Association
Minnesota Surgical Society
Northern Minnesota Medical Association
Southern Minnesota Medical Association

MATION

they appear in the text. All photographs must be in black and white, clear trasting, and on glossy prints. Instructions for combining photographs are e. Any number of illustrations over 4 are charged to the author. Combinations graphs up to one-half page (6 x 4⅜ inches) count as 1 illustration.

and Reviewers

ght is reserved to reject material submitted for reading or advertising columns. s expressed in this journal do not necessarily represent those of the Minnesota dical Association or any of its constituents.

ers and Subscribers

ed advertising—10 cents a word; minimum charge $2.00; key number, 25c l. Remittance should accompany order. Display advertising rates on request.

Subscription—$3.00. Single Copies—$0.40. Foreign and Canadian—$3.50.

unications concerning advertising and subscriptions should be addressed to TA MEDICINE, 2642 University Avenue, Saint Paul 14, Minnesota. Telephone Mid-41.

ht and Post Office Entry

its of MINNESOTA MEDICINE ©1956 by Minnesota State Medical Association.

d at the Post Office in Saint Paul as second class matter. Accepted for mailing at ial rate of postage provided for in Section 1103, Act of October 3, 1917, d July 13, 1918.

Board of Editors

ARTHUR H. WELLS, M.D.
Editor-in-Chief, Duluth

STUART W. ARHELGER, M.D.
Minneapolis

JOHN F. BRIGGS, M.D.
Saint Paul

S. FRANCIS CEPLECHA, M.D.
Redwood Falls

TAGUE C. CHISHOLM, M.D.
Minneapolis

ROBERT B. HOWARD, M.D.
Minneapolis

R. DREW MILLER, M.D.
Rochester

HENRY G. MOEHRING, M.D.
Duluth

GLENN J. MOURITSEN, M.D.
Fergus Falls

OLIVE V. SEIBERT, B.A.
Saint Paul

GEORGE STILWELL, M.D
Rochester

WHY
SENSITIZE

in topical and ophthalmic infections

USE
'POLYSPORIN'®
brand
POLYMYXIN B—BACITRACIN OINTMENT

to insure broad-spectrum therapy
with minimum allergenicity

For topical use: in ½ oz. and 1 oz. tubes.
For ophthalmic use: in ⅛ oz. tubes.

BURROUGHS WELLCOME & CO. (U.S.A.) INC., Tuckahoe, N. Y.

For pain—

Effective orally as well as parenterally
with relief lasting six to eight hours

Levo-Dromoran 'Roche' is the most potent narcotic-analgesic presently available, natural or synthetic. It is practically as effective by mouth as by injection, and can therefore simplify nursing care. Has a margin of safety approximately equal to that of morphine, but with less tendency to induce constipation.

Levo-Dromoran® Tartrate - brand of
levorphan tartrate

ROCHE
Original Research
in Medicine and Chemistry

Visitors permitted

Your patients on Gantrisin can usually look forward to rapid recovery from bacterial infections. Gantrisin achieves high plasma and urine levels, minimizes the dangers of sensitization and overgrowth of fungi, and is well tolerated by patients of all ages. A wide range of pathogens are susceptible to this single, soluble, wide-spectrum sulfonamide.

Hoffmann - La Roche Inc · Nutley · N.J.

ROCHE

Gantrisin® 'Roche' - brand of sulfisoxazole

How Safe are Municipal Bonds?

Municipal Bonds, as a group, have proved to be the safest form of gilt-edge investment. Next to United States Government Bonds, no other form of investment has experienced a safer record.

Because of the safety record of Municipal Bonds, this type of investment has long been a favorite of conservative investors everywhere.

Reprinted from
"Municipal Bonds
and You"
our colorful
sixteen-page
book that is
available to
you Free!

FOR A SECURE FUTURE—INVEST IN MUNICIPAL BONDS

Are Municipal Bonds Worthy Investments?

There is no investment more worthy of your consideration. Your dollars invested in Municipal Bonds help build a better America—its schools, highways, hospitals, public buildings, water, electric, sewer and natural gas systems, and many other things to improve our ever higher standard of living.

Name______________________________

Address____________________________

City____________________ State________

MM-6-6

JURAN & MOODY, INC.

Municipal Bonds Exclusively

Rand Tower
MINNEAPOLIS 2

93 East 6th St.
ST. PAUL 1
TELEPHONE: CApital 4-9661

Citizens and Southern Building
ATLANTA, GA.

Immediate and Sustained

TRANQUILLITY

NEW

Reserpine c̄ Mebaral®

TABLETS

Each tablet contains:

Reserpine	0.15 mg.	*for* hypothalamic *action*
Mebaral	30 mg.	*for* cortical *action*

Indicated in

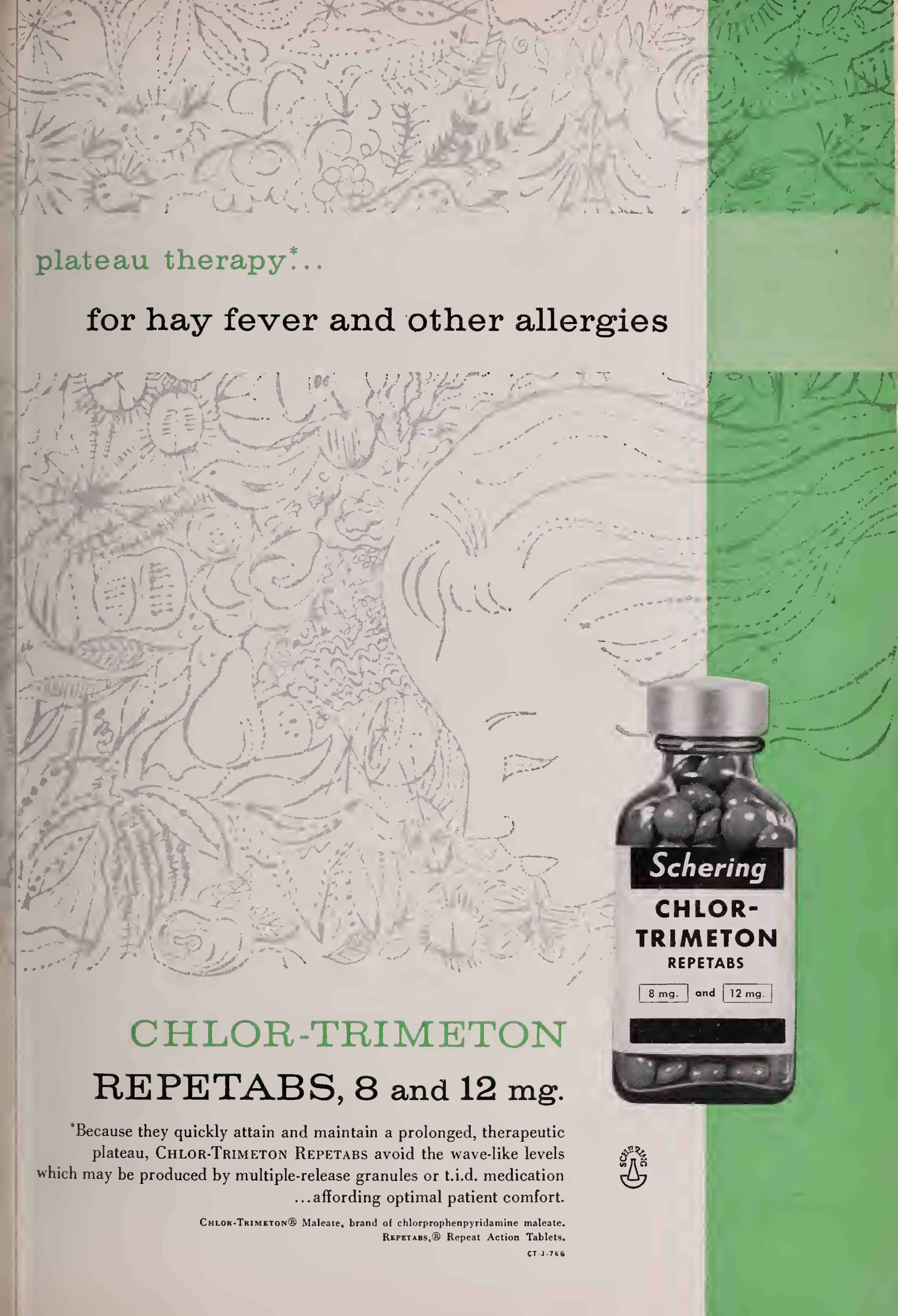
ANXIETY AND TENSION STATES
PREMENSTRUAL TENSION
MENOPAUSAL SYNDROME
ESSENTIAL HYPERTENSION
ANGINA PECTORIS
CORONARY OCCLUSION

DOSE: 1 tablet 3 times daily. ● SUPPLIED: Bottles of 100 tablets.

Relaxation WITHOUT LOSS OF ALERTNESS

Winthrop LABORATORIES
NEW YORK 18, N. Y.

Mebaral (brand of mephobarbital), trademark reg. U.S. Pat. Off.


Schering
CHLOR-TRIMETON
REPETABS
8 mg. and 12 mg.
SCHERING

plateau therapy*...

for hay fever and other allergies

CHLOR-TRIMETON

REPETABS, 8 and 12 mg.

*Because they quickly attain and maintain a prolonged, therapeutic plateau, CHLOR-TRIMETON REPETABS avoid the wave-like levels which may be produced by multiple-release granules or t.i.d. medication ...affording optimal patient comfort.

CHLOR-TRIMETON® Maleate, brand of chlorprophenpyridamine maleate.
REPETABS,® Repeat Action Tablets.
CT-J-766

DOCTORS EVERYWHERE NOW KNOW WHY

Viceroys Are Smoother

THE VICEROY TIP HAS . . .
TWICE AS MANY FILTERS

Professional men who have studied the microscopic analysis of the Viceroy filter now know why the Viceroy taste is smoother—never rough. Only Viceroy has 20,000 tiny filters in every tip—twice as many filters as the other two largest-selling filter brands. That is why Viceroys are smoother by far—never, never rough. That is why so many doctors now smoke and recommend Viceroys.

Yes, smoother taste because there are

TWICE AS MANY FILTERS IN EVERY VICEROY TIP

as the other two largest-selling filter brands!

Viceroy
Brand B
Brand C
TWICE AS MANY FILTERS
Only HALF the FILTERS
LESS than HALF the FILTERS

Viceroy's exclusive filter is made from pure cellulose—soft, snow-white, natural!

VICEROY
TWENTY
VICEROY
Filter Tip
CIGARETTES
KING-SIZE

pronounced

MUSCLE-RELAXING ACTION

Equanil*

MEPROBAMATE

(2-methyl-2-*n*-propyl-1,3-propanediol dicarbamate)

LICENSED UNDER U.S. PATENT NO. 2,724,720

For significant relief in myositis, osteoarthritis, backstrain, and related conditions marked by:

- ***Muscle spasm***
- ***Stiffness and tenderness***
- ***Restriction of motion***
- ***Pain***

As a superior muscle-relaxant, EQUANIL offers predictable action and full effectiveness on oral administration. It does not disturb autonomic function and is relatively free from gastric and other significant side-effects. Its anti-anxiety property provides important correlative value.

Usual dosage: 1 tablet t.i.d. The dose may be adjusted either up or down, according to the clinical response of the patient.
Supplied: Tablets, 400 mg., bottles of 50.

Wyeth®
Philadelphia 1, Pa.

anti-anxiety factor
with muscle-relaxing action
...relieves tension

KARO® SYRUP...meets all the criteria for effective milk modification

Because Karo Syrup is a balanced fluid mixture of dextrins, maltose, and dextrose, it is well tolerated, easily digested and completely utilized. Its use will not induce flatulence, colic, fermentation or allergy.

Obviously, the selection of a milk modifier for infant feeding depends to a large extent upon the needs of the individual infant. But, after three generations of use, Karo is still a carbohydrate modifier of choice for *all* infants.

From the standpoint of the physician, Karo permits easy adjustment of formula and safe transition from liquid to solid food as circumstances demand.

Mothers appreciate the fact that Karo is readily available, inexpensive and easy to use.

Light or dark Karo Syrup may be used interchangeably, with cow's milk or evaporated milk and water. Each tablespoonful yields 60 calories.

Karo
SYRUP
CRYSTAL WHITE

1906 • 50th ANNIVERSARY • 1956
CORN PRODUCTS REFINING COMPANY
17 Battery Place, New York 4, N. Y.

BON VOYAGE BEGINS WITH BONAMINE* HCl

BRAND OF MECLIZINE HYDROCHLORIDE

longest-acting motion-sickness remedy[1] effective in low dosage . . . controls motion sensitivity symptoms in minutes . . . one dose usually prevents motion sickness for 24 hours.

in recommended dosage Bonamine is notably free from side reactions . . . supplied as: BONAMINE TABLETS, scored, tasteless, 25 mg. . . . BONAMINE CHEWING TABLETS, pleasantly mint flavored, 25 mg.

*Trademark 1. Report of Study by Army, Navy, Air Force Motion Sickness Team: J.A.M.A. 160:755 (March 3) 1956.

Pfizer PFIZER LABORATORIES, *Division, Chas. Pfizer & Co., Inc.*, Brooklyn 6, N. Y.

Now, for only $4950* G. E. brings you complete 200-ma x-ray facilities

*f.o.b. Milwaukee, U.S.A.

for fluoroscopy

for radiography

New PATRICIAN diagnostic unit — the low-cost x-ray unit with major features you've always wanted. You get 81-inch angulating table • independent tube stand with choice of floor-to-ceiling or platform mounting • 200 ma-100 kvp, full-wave transformer and control • double-focus, rotating-anode tube. But that's not all.

You're equipped for vertical and horizontal radiography — Bucky and non-Bucky technics —even cross-table and stereo views. Focal-film distances up to full 40 inches at any table angle . . . as great as 48 inches cross-table.

The new PATRICIAN features a counterbalanced fluoroscopic unit with full screening coverage. Even the new automatic reciprocating Bucky is counterbalanced — self-retaining in all table positions.

Contact your General Electric x-ray representative for details or demonstration, and be sure to have him explain the G-E Maxiservice® *rental* plan.

Progress Is Our Most Important Product

GENERAL ELECTRIC

Direct Factory Branches:
MINNEAPOLIS — 808 Nicollet Avenue
DULUTH — 928 East 2nd Street

Resident Representatives:
MANKATO — J. F. Van Osdell, 123 Blue Earth
ST. PAUL — R. H. Holen, 153 W. Robie
SIOUX FALLS — H. L. Norlin, 1908 S. Sixth Street

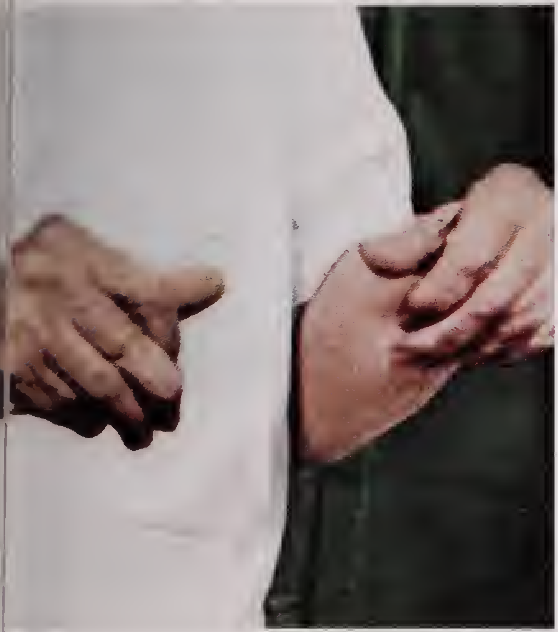
in rheumatoid arthritis

METICORTEN

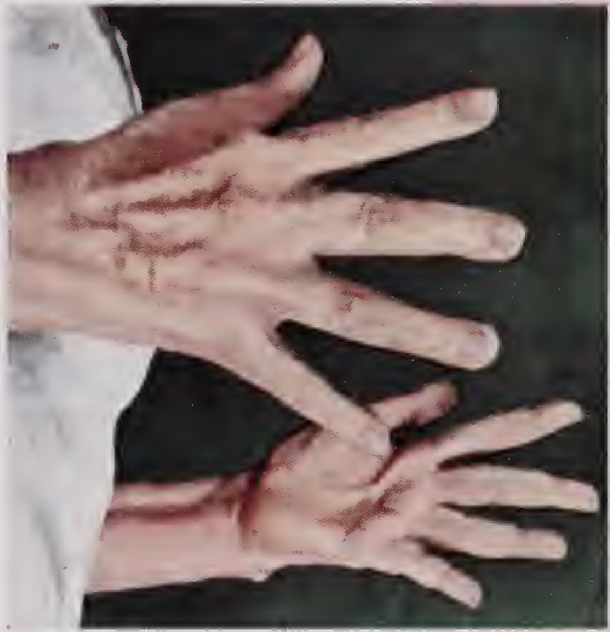
(PREDNISONE)

Schering

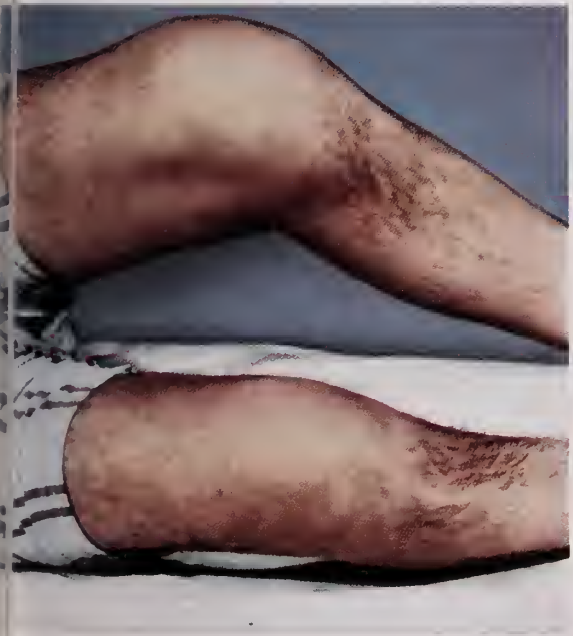
results—*excellent* · edema—*rare*



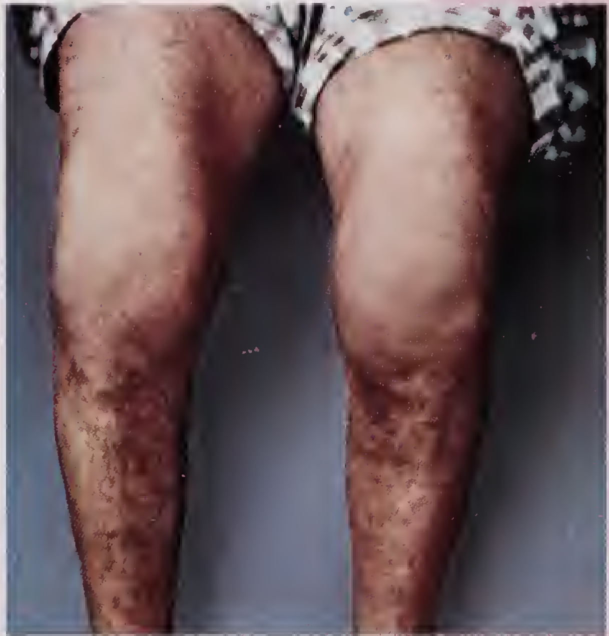
formed hands of woman with rheumatoid arthritis ore therapy. Unable to open hands.



After two weeks on METICORTEN, *patient is free of pain and can open hands completely.*



utely swollen, painful knees in man with rheumatoid hritis before therapy.



After two weeks on METICORTEN, *swelling of knees is gone and patient can walk without difficulty.*

Schering
METICORTEN
PREDNISONE
SCHERING

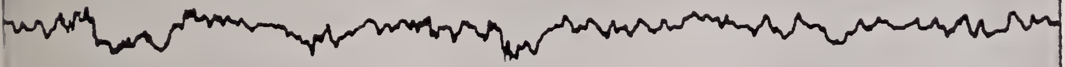
in corticosteroid therapy
permits treatment
of more patients

- rarely causes edema or electrolyte side actions
- 3 to 5 times more potent, milligram for milligram, than hydrocortisone or cortisone
- excellent relief of pain, swelling, tenderness; diminished joint stiffness—in rheumatoid arthritis
- excellent relief of bronchospasm, dyspnea, cough; increased vital capacity in asthma
- hormone benefits in respiratory allergies, inflammatory and allergic eye and skin disorders, collagen diseases

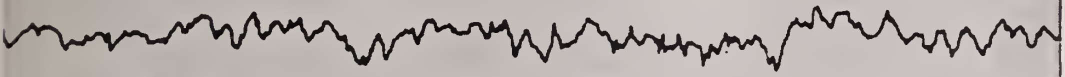
METICORTEN is available in 1 mg., 2.5 mg. and 5 mg. white tablets, and as 2.5 mg. and 5 mg. capsules.
METICORTEN,* brand of prednisone. MC-J-614 356 *T.M.

WHAT IS THE DIFFERENCE BETWEEN A TRANQUILIZER AND A SEDATIVE?

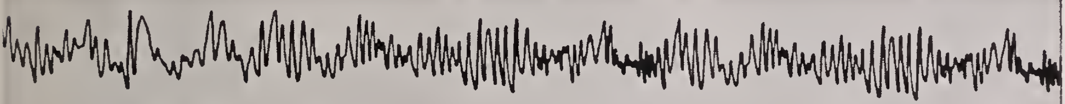
Comparison of the effect of Raudixin (tranquilizer) and a barbiturate (sedative) on the cortical electroencephalogram



No drug.



After Raudixin. E. E. G. not altered.



After barbiturate. Typical "spindling" effect.

Because barbiturates and other sedatives depress the cerebral cortex, the sedation achieved is accompanied by a reduction in mental alertness.

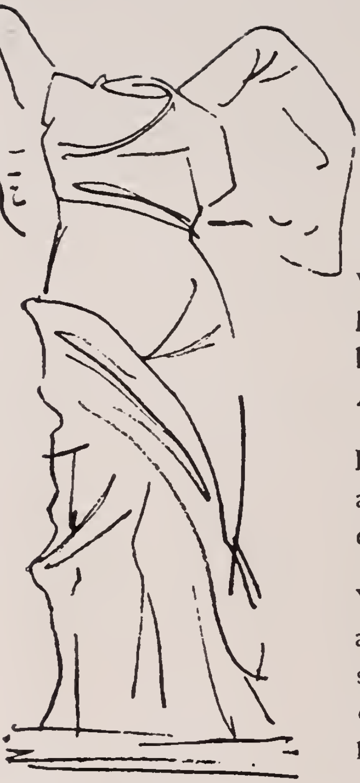
Raudixin acts in the area of the midbrain and diencephalon, and does not depress the cerebral cortex. Consequently, the tranquilizing (ataractic) effect achieved is generally free of loss of alertness.

RAUDIXIN
Squibb Whole Root Rauwolfia Serpentina

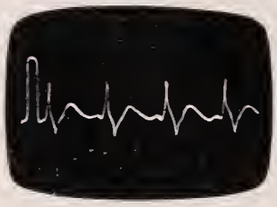
DOSAGE: 100 mg. b.i.d. initially; may be adjusted within a range of 50 mg. to 500 mg. daily. Most patients can be adequately maintained on 100 mg. to 200 mg. per day.

SUPPLY: 50 mg. and 100 mg. tablets; bottles of 100, 1000 and 5000.

SQUIBB *Squibb Quality—the Priceless Ingredient* 'RAUDIXIN'® IS A SQUIBB TRADEMARK



Lasker Award statuette



an acknowledgment

We are proud that our television series on the NBC network, "The March of Medicine", has been selected to receive the first Albert Lasker Award in the field of television and radio.

But we feel that those really being honored are you—the physicians and research scientists of America.

Your sense of responsibility to the public—and that of your hospitals, laboratories, and staffs—has made it possible for "The March of Medicine" to report the story of medical progress.

The Lasker Awards heretofore have been bestowed on many of the nation's outstanding medical scientists and journalists. As a member of the pharmaceutical industry, we are particularly grateful for the honor represented by this award.

We are also grateful for the support we have continually received from the American Medical Association, which has cooperated in this series from the very beginning.

Francis Boyer

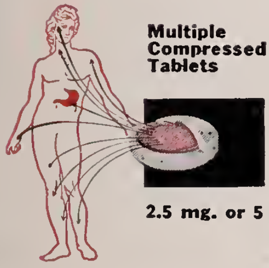
Francis Boyer
President
Smith, Kline & French Laboratories

in rheumatoid arthritis

ROUTINE
CO-ADMINISTRATION
MEANS

'Co-Deltra'
(Buffered Prednisone)

'Co-Hydeltra'
(Buffered Prednisolone)



Clinical evidence[1, 2, 3] indicates that to augment the therapeutic advantages of prednisone and prednisolone, antacids should be *routinely* co-administered to minimize gastric distress.

2.5 mg. or 5 mg. prednisone or prednisolone with
50 mg. magnesium trisilicate
and 300 mg. aluminum hydroxide gel.

References: 1. Boland, E. W., *J.A.M.A.* 160:613, February 25, 1956. 2. Margolis, H. M., *et al.* *J.A.M.A.* 158:454, June 11, 1955. 3. Bollet, A. J., *et al.* *J.A.M.A.* 158:459, June 11, 1955.

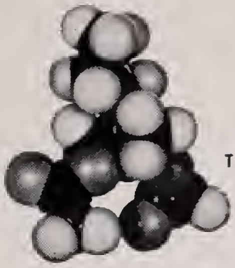
SHARP & DOHME
Philadelphia 1, Pa.
DIVISION OF MERCK & CO., INC.

'CO-DELTRA' *and* 'CO-HYDELTRA' *are the trademarks of* MERCK & CO., INC.

ALL THE BENEFITS OF THE "PREDNI-STEROIDS" PLUS POSITIVE ANTACID ACTION TO MINIMIZE GASTRIC DISTRESS

save the cigarette for later... Time was you had to wait for a local anesthetic to take hold —you waited, patient waited, nurse waited. **Now, rapid anesthesia....** Blockain* works so fast that clinicians had to describe it as "immediate" and "almost instantaneous." It's practically an understatement to call its action "rapid." **Longer anesthetic duration....** Besides being able to go to work sooner, you can work at an easier pace. Blockain lasts long enough so you can proceed from incision to closure on one injection. You finish up with a neat suture line undistorted by repeated instillations. The patient leaves uncomplaining and comfortable. ☞ *A busy clinician's experience with Blockain in fourteen cases of Colles' fracture:* A single 2-5 cc. injection of Blockain into the hematoma produced anesthesia in an average of 3 minutes 15 seconds. The average duration of these operations, closed reductions, was 25 minutes. Anesthesia persisted beyond the time required for reduction permitting splints to be applied, postreduction X-rays to be taken and the patients sent home feeling comfortable. **BLOCKAIN,** 30 cc., 0.5% (5 mg/cc.). Your office-ideal local anesthetic. For additional information write GEORGE A. **Breon** & COMPANY, 1450 Broadway, New York 18, N. Y.

*BLOCKAIN® BRAND OF PROPOXYCAINE HYDROCHLORIDE BREON.



THE MILTOWN MOLECULE

A tranquilizer well suited for prolonged therapy

NO ORGANIC CONTRAINDICATIONS

reported to date

- well tolerated, non-addictive, essentially non-toxic
- no blood dyscrasias, liver toxicity, Parkinson-like syndrome or nasal stuffiness
- chemically unrelated to chlorpromazine or reserpine
- does not produce significant depression
- orally effective within 30 minutes for a period of 6 hours

Indications: anxiety and tension states, muscle spasm.

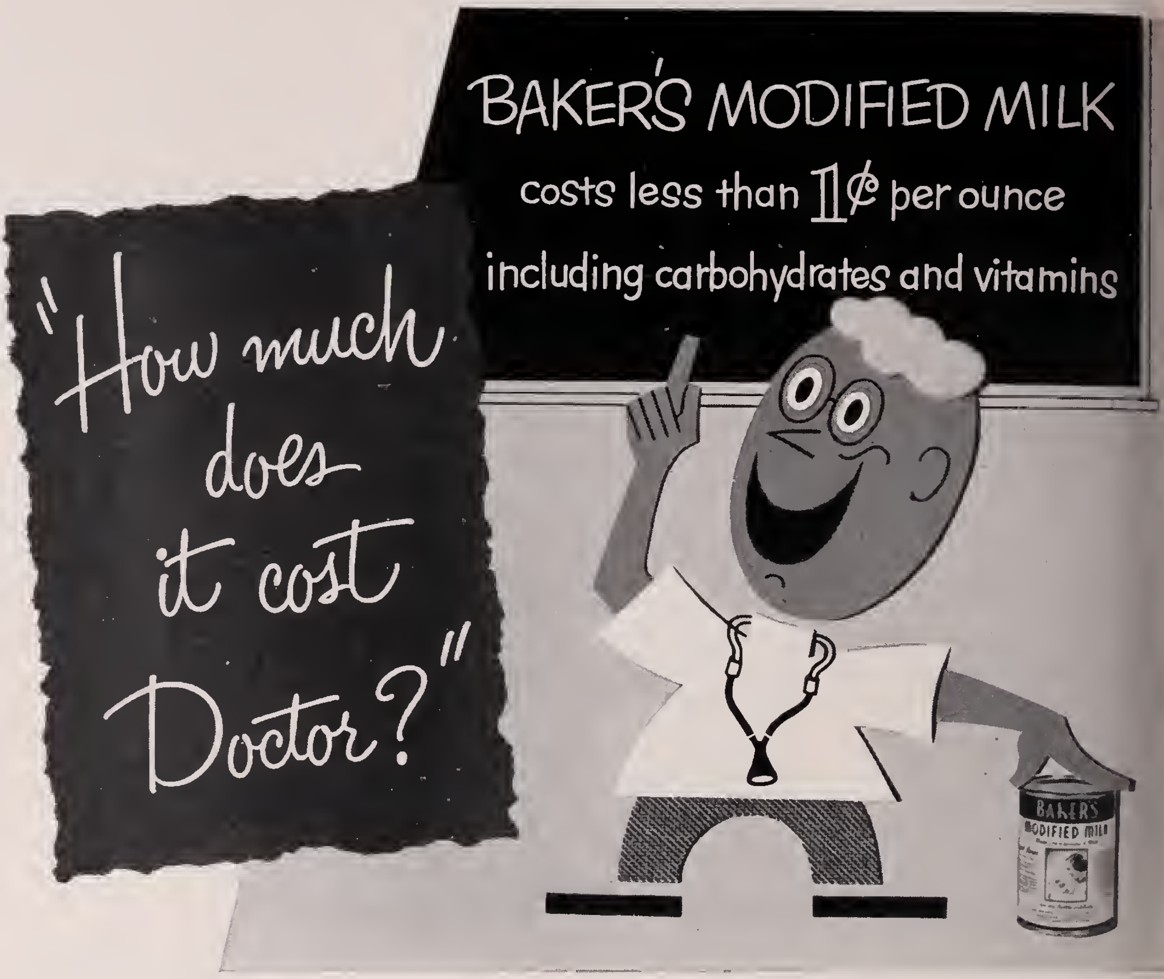
Miltown®

the original meprobamate—2-methyl-2-*n*-propyl-1,3-propanediol dicarbamate—U.S. Patent 2,724,720

SUPPLIED: 400 mg. scored tablets. Usual dose: 1 or 2 tablets t.i.d.

DISCOVERED AND INTRODUCED by Wallace Laboratories, New Brunswick, N. J.

Literature and Samples Available on Request


"How much does it cost Doctor?"
BAKER'S MODIFIED MILK
costs less than 1¢ per ounce
including carbohydrates and vitamins
BAKER'S MODIFIED MILK

You have an economical answer
BAKER'S MODIFIED MILK*

When a mother asks about the cost of a formula for her baby, your answer can truthfully be "Baker's is economical."

Baker's is a complete food containing added carbohydrate, and adequate amounts of all known essential vitamins and minerals. Because Baker's is sold at an extremely low price, one ounce of formula costs less than a penny—about $1.50 per week for most infants.

Prescribe Baker's Modified Milk in the hospital and thus provide mothers with an economical, complete infant formula.

***Made exclusively from Grade A Milk (U. S. Public Health Service Milk Code)**

THE BAKER LABORATORIES, INC.
Milk Products Exclusively for the Medical Profession
***Main Office:* Cleveland 3, Ohio • *Plant:* East Troy, Wisconsin**

your patient should not be endangered by fluid accumulation during "rest periods"

YOUR PATIENT NEEDS AN ORGANOMERCURIAL

When a diuretic must evoke acidosis to be effective, continued administration without dosage limitation results in refractoriness. Other diuretics may require interrupted dosage to avoid gastrointestinal irritation.

But the sustained diuresis achieved by the organomercurials never necessitates routine "rest periods" because of their mode of action.

TABLET **NEOHYDRIN®**

BRAND OF CHLORMERODRIN (18.3 MG. OF 3-CHLOROMERCURI-2-METHOXY-PROPYLUREA EQUIVALENT TO 10 MG. OF NON-IONIC MERCURY IN EACH TABLET)

a standard for initial control of severe failure **MERCUHYDRIN® SODIUM**
BRAND OF MERALLURIDE INJECTION

01256

LAKESIDE

clinically proved in many common infections[1-60]

Hemolytic streptococcal infections

Pharyngitis/Tonsillitis/Sinusitis
Otitis media/Mastoiditis
Scarlet fever/Lymphadenitis/Erysipelas

Staphylococcal infections/Pneumococcal infections/Gonococcal infections/Vincent's Infection/Prevention of streptococcal infection in individuals with a history of rheumatic fever/Prevention of secondary infection due to penicillin-susceptible organisms

in dosage of just 1 or 2 tablets t.i.d.

and is far less costly than other penicillin salts

Pentids

SQUIBB 200,000 UNIT BUFFERED PENICILLIN G POTASSIUM TABLETS

Recommended dosage: 1 or 2 tablets t.i.d. without regard to meals. Bottles of 12 and 100.

References: 1. Boger, W. P., J. Amer. Ger. Soc. 3:556, Aug. 1955. 2. Lapin, J. H., Ann. Allergy 13:169, March-April 1955. 3. Andelman, M. B. and Fischbein, W. I., Antibiotic Med. 1: 136, March 1955. 4. Statements of American Heart Association, Council on Rheumatic Fever and Congenital Heart Disease, Circulation 11:317, Feb. 1955. 5. Miller, J. M. et al., Antibiotics Annual 1954-55, Medical Encyclopedia Inc., N. Y., p. 105. 6. Seal, J. R. et al., J. Lab. & Clin. Med. 44:831, Dec. 1954. 7. Martin, W. J. et al., Am. Pract. & Dig. Treat. 5:813, Oct. 1954. 8. Henner, R., Eye, Ear, Nose & Throat Monthly 33:530, Sept. 1954. 9. Rodstein, M. and Young, D., Clin. Med. 61:695, Sept. 1954. 10. Bernstein, S. H. et al., A. M. A. Arch. Int. Med. 93:894, June 1954. 11. Craige, E., North Carolina M. J. 14:593, Dec. 1953. 12. Barach, A. L., J. Amer. Ger. Soc. 1:616, Sept. 1953. 13. Barach, A. L., Geriatrics 8:423, Aug. 1953. 14. Boger, W. P., Indus. Med. & Surg. 22:288, July 1953. 15. Young, D. and Rodstein, M., J.A.M.A. 152:987, July 1953. 16. Queries and Minor Notes, J.A.M.A. 152:1083, July 1953. 17. Roberts, E., A. M. A. Amer. J. Dis. Child. 85: 643, June 1953. 18. Spink, W. W., J.A.M.A. 152:585, June 1953. 19. Huang, N. N. and High, R. H., J. Pediat. 42:532, May 1953. 20. Antibiotics: Round Table Discussion, Pediatrics 11:270, March 1953. 21. Feinberg, B., Rhode Island M. J. 36: 138, March 1953. 22. Flippin, H. F., Delaware State M. J. 25: 55, March 1953. 23. Denny, F. W. Jr., Postgrad. Med. 13:153, Feb. 1953. 24. Flood, J. M., A. M. A. Arch. Dermat. & Syph. 67:42, Jan. 1953. 25. Kohn, K. H., Milzer, A. and MacLean, H., J.A.M.A. 151:347, Jan. 1953. 26. Siegal, S. et al., J. Allergy 24:1, Jan. 1953. 27. Statements of American Heart Association, Council on Rheumatic Fever and Congenital Heart Disease, J.A.M.A. 151:141, Jan. 1953. 28. Keefer, C. S., Pennsylvania M. J. 55:1177, Dec. 1952. 29. Kerrell, W. E., J.A.M.A. 150:1450, Dec. 1952. 30. Levy, D. F., Connecticut State M. J. 16:899, Dec. 1952. 31. Romansky, M. J. and Kelser, G. A., J.A.M.A. 150:1447, Dec. 1952. 32. Thomas L., Minnesota Med. 35:1105, Dec. 1952. 33. Jones, C. C., J. Iowa M. Soc. 42:533, Nov. 1952. 34. Reimann, H. A., Postgrad. Med. 12:255, Sept. 1952. 35. Bunn, P. A., N. Y. State J. Med. 52:2005, Aug. 1952. 36. Finland, M., New England J. Med. 247:557, Oct. 1952. 37. Babione, R. W. et al., U. S. Armed Forces M. J. 3:973, July 1952. 38. Hansen, A. E., South. M. J. 45:423, May 1952. 39. Dowling, H. F., G. P. 5:53, Feb. 1952. 40. Rhoades, P. S., G. P. 5:67, Feb. 1952. 41. Dowling, H. F. and Lepper, M. H., Med. Clin. North Amer., Jan. 1952, p. 247. 42. Karelitz, S. and Schifrin, N., Postgrad. Med. 11:17, Jan. 1952. 43. Panel Discussion, Pennsylvania M. J. 55:42, Jan. 1952. 44. Flippin, H. F. et al., J.A.M.A. 147:918, Nov. 1951. 45. Massell, B. F., Mod. Concepts Cardiovas. Dis. 20:105, Sept. 1951. 46. Weinstein, L., Boston Med. Quarterly 2:1, Sept. 1951. 47. Massell, B. F. et al., J.A.M.A. 146:1469, Aug. 1951. 48. Finland, M., Bull. New York Acad. Med., 27:199, April 1951. 49. Wheatley, D., Brit. M. J. 1:703, March 1951. 50. Keefer, C. S., Postgrad. Med. 9:101, Feb. 1951. 51. Bunn, P. A. et al., J.A.M.A. 144: 1540, Dec. 1950. 52. Weinstein, L. and Perrin, T. S., J. Pediat. 47:844, Dec. 1950. 53. Keefer, C. S., Am. J. Med. 7:216, Aug. 1949. 54. Robinson, J. A., Hirsch, H. L. and Dowling, H. F., Am. J. Med. 4:716, 1948. 55. Barach, A. L. and Garthwaite, B., Ann. Allergy 5:297, Aug. 1947. 56. Herrold, R. D., J. Urol. 57:897, May 1947. 57. White, H. J., Lee, M. E. and Alverson, C., Proc. Soc. Exper. Biol. & Med. 62:35, 1946. 58. Baumann, F. et al., J. Allergy 17:264, Sept. 1946. 59. Gamble, T. O. et al., Am. J. Obst. & Gynec. 50:514, Nov. 1945. 60. Woofter, A. C. and Hoffman, O. E., J. Iowa M. Soc. 35:189, May 1945.

'PENTIDS'® IS A SQUIBB TRADEMARK

SQUIBB Squibb Quality—the Priceless Ingredient

BETTER

results are obtained
with STERANE[1]—3 to 5
times more active than
hydrocortisone or cortisone.

BREATHING

capacity is greatly enhanced.
"Relief of symptoms is more
complete and maintained for
longer periods with relatively
small doses."[2]

BALANCE

of minerals and fluids usually
remains undisturbed. This
proves "especially advantageous in those patients with
cardiac failure requiring
therapy . . ."[3]

in bronchial asthma

Sterane®

brand of prednisolone

Supplied: White, 5 mg. oral tablets,
bottles of 20 and 100. Pink, 1 mg.
oral tablets, bottles of 100.
Both deep-scored.

1. Johnston, T. G., and Cazort, A. G.:
J. Allergy 27:90, 1956. 2. Schwartz, E.:
New York J. Med. 56:570, 1956.
3. Schiller, I. W., et al.: J. Allergy
27:96, 1956.

PFIZER LABORATORIES
Division, Chas. Pfizer & Co., Inc.
Brooklyn 6, New York

New STEELINE Pediatric Table

Eases the burden of the physician's daily work

Includes built-in tare balance scale, built-in measuring rod, foam rubber cushion and electrical outlets with cord and plug—there are no accessories to buy. Top quality construction features include all-welded steel body, two roomy drawers and a large open compartment with shelf, providing easy, unhampered access to instruments and supplies. Front edge is protected from wear by a stainless steel baffle plate. Despite the fact that this new table has been designed to provide the physician with the best modern equipment, efficient modern production methods in our own factory permit us to keep the price well below that of comparable models. Write today for complete information.

a. s. aloe company OF MINNESOTA
927 Portland Avenue, Minneapolis 4, Minn. • Phone:

for your complete insurance needs . . .

- ☆ PROFESSIONAL
- ☆ PERSONAL
- ☆ PROPERTY

CHOICE OF THE MINNESOTA MEDICAL ASSOCIATION FOR PROFESSIONAL LIABILITY INSURANCE

ST. PAUL FIRE AND MARINE CO. • ST. PAUL MERCURY INDEMNITY CO. • MERCURY INSURANCE CO.
The Saint Paul Companies
SINCE 1853
INSURANCE
LAND • SEA • AIR

THERE IS A SAINT PAUL AGENT IN YOUR COMMUNITY
AS CLOSE AS YOUR PHONE

HOME OFFICE: 111 WEST FIFTH STREET, SAINT PAUL 2, MINNESOTA

THIS IS HOW

Rauwiloid®

The original alseroxylon fraction of India-grown Rauwolfia serpentina, Benth.

Differs

from all other Rauwolfia preparations

Antihypertensive

Bradycrotic

Tranquilizing

Higher Clinical Efficacy

Rauwiloid represents the balanced, mutually potentiated actions[1] of several Rauwolfia alkaloids, of which reserpine and the equally antihypertensive rescinnamine have been isolated. Hence, contrary to reports from some quarters, reserpine is not the only active principle of the Rauwolfia plant. Rauwiloid contains *all* the active principles, but it is freed of the undesirable dross of the crude Rauwolfia root.

Greater Safety

No single commercially available alkaloid can provide the full efficacy of Rauwiloid together with Rauwiloid's low incidence/low intensity of side actions.[2] For example, mental depression is "much less frequent with alseroxylon..."[2] Rauwiloid is safely used even in the presence of cardiac, renal, and cerebrovascular complications of hypertension.

Simplified Dosage

Dosage is simple...merely two 2 mg. tablets at bedtime. When desired effect has been obtained, one tablet per day often suffices.

---

1. Cronheim, G., and Toekes, I. M.: Comparison of Sedative Properties of Single Alkaloids of Rauwolfia and Their Mixtures, Meet. Am. Soc. Pharmacol. & Exper. Therap., Iowa City, Iowa, Sept. 5, 1955.
2. Moyer, J. H.; Dennis, E., and Ford, R.: Drug Therapy (Rauwolfia) of Hypertension. II. A Comparative Study of Different Extracts of Rauwolfia When Each Is Used Alone (Orally) for Therapy of Ambulatory Patients with Hypertension, A.M.A. Arch. Int. Med. *96*:530 (Oct.) 1955.

Riker

LOS ANGELES

With Sunglasses
Without Sunglasses

Prescribe year-round **eye comfort** for your patients' outdoor activities

More of your patients are spending more of their time out-of-doors than ever before.

As a part of your service of providing complete eye care, we suggest you prescribe sun glasses for year-round eye comfort.

Remember, when you do, BENSON'S stands ready to give you quick, dependable service from the Upper Midwest's largest and most complete stock . . .

G15 • greens 2 and 3 • full lines of A O Calobars and B & L Ray-Bans . . . regular and large size lenses in hundreds of beautifully styled frames (plain or with precious metal trim). *Many tints available in multifocals.*

Since 1913 **Benson** OPTICAL COMPANY *Executive Offices • Minneapolis 2, Minn.*

COMPLETE LABORATORIES CONVENIENTLY LOCATED IN UPPER MIDWEST CITIES

For complete gall bladder regimen... *Colicell*

A single COLICELL tablet is more effective for a longer period and is carefully coated to prevent gastric disturbance. In bottles of 100 and 1000 tablets.

SAMPLES AND LITERATURE ON REQUEST
SUTLIFF & CASE COMPANY, INC.
Pharmaceutical Specialties • PEORIA, ILLINOIS

Each Tite-Coat Red Tablet Contains:

Extracts of Whole Bile (Equal parts Ox and Hog)	210.0 mg.
Ketocholanic Acids (Oxidized or keto form of normally occurring bile acids containing approximately 93% dehydrocholic acid)	90.0 mg.
Methyl Cellulose	130.0 mg.
Homatropine Methylbromide	2.5 mg.

The
NEW
Phenothiazine
Derivative

Sparine*

Promazine Hydrochloride
10-(γ-dimethylamino-n-propyl)-phenothiazine hydrochloride

For the Management of the Acutely Agitated Patient

• *The acute alcoholic* • *The acute psychotic* • *The drug addict*

A promising new agent in chemopsychotherapeutics, SPARINE has demonstrated impressive effectiveness in controlling acute excitation without inducing significant side-reactions.[1,2,3]

SPARINE is a new, clinically effective phenothiazine derivative, which may be administered intravenously, intramuscularly, or orally. The route and dosage are determined by the extent of central-nervous-system excitation and by the patient's response.

Supplied: Tablets, 25, 50, and 100 mg., bottles of 50 and 500; 200 mg., bottles of 500. Injection, 50 mg. per cc., vials of 2 and 10 cc.

1. Seifter, J., et al.: To be published. 2. Fazekas, J.F., et al.: M. Ann. District of Columbia 25:67 (Feb.) 1956. 3. Mitchell, E.H.: J.A.M.A. In press.

Wyeth®
Philadelphia 1, Pa.

*Trademark

An Exclusive Development of Wyeth Research

magnified potency

with Meti-steroid

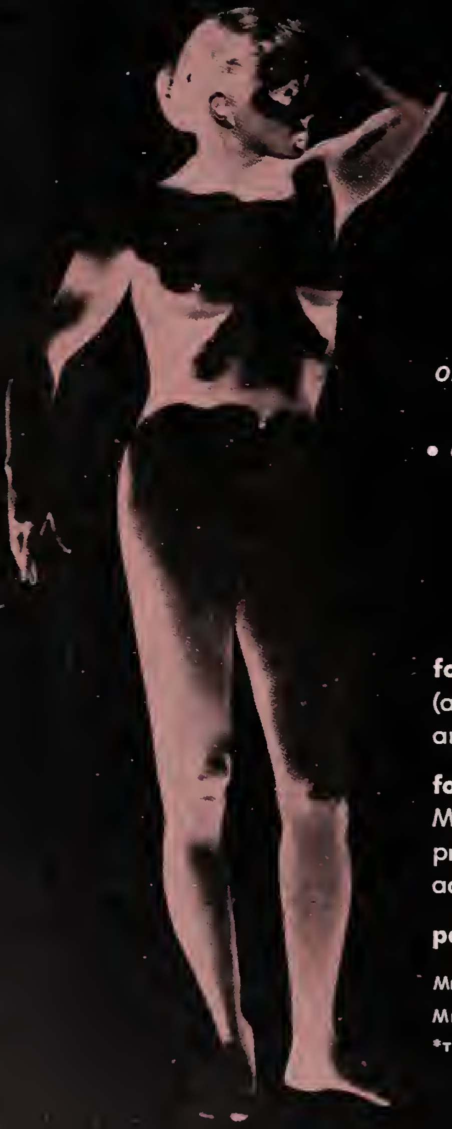
effectiveness in allergic

and inflammatory dermatoses

new

Meti-Derm cream 0.5%

with METICORTELONE, original brand of prednisolone



- *approximately twice the per milligram anti-inflammatory activity of topical hydrocortisone*
- *cosmetically acceptable*
- *water-washable*

for effective local relief of allergic (atopic and contact) dermatoses, nonspecific anogenital pruritus.

formula: Each gram of water-washable METI-DERM Cream contains 5 mg. (0.5%) of prednisolone, free alcohol, in a cosmetically acceptable base.

packaging: METI-DERM Cream, 0.5%, 10 Gm. tube.

METI-DERM,* brand of prednisolone topical.
METICORTELONE,® brand of prednisolone.
*T.M.

...and adding dual control

to Meti-steroid skin therapy—

protection

against infection

new

Meti-Derm ointment

with Neomycin

enhanced effectiveness

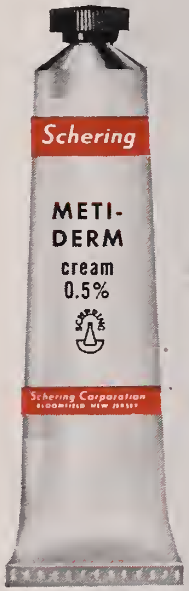
in allergic, inflammatory

dermatoses when

minor infection

is present

or anticipated


Schering
METI-DERM
cream
0.5%
Schering Corporation
BLOOMFIELD NEW JERSEY

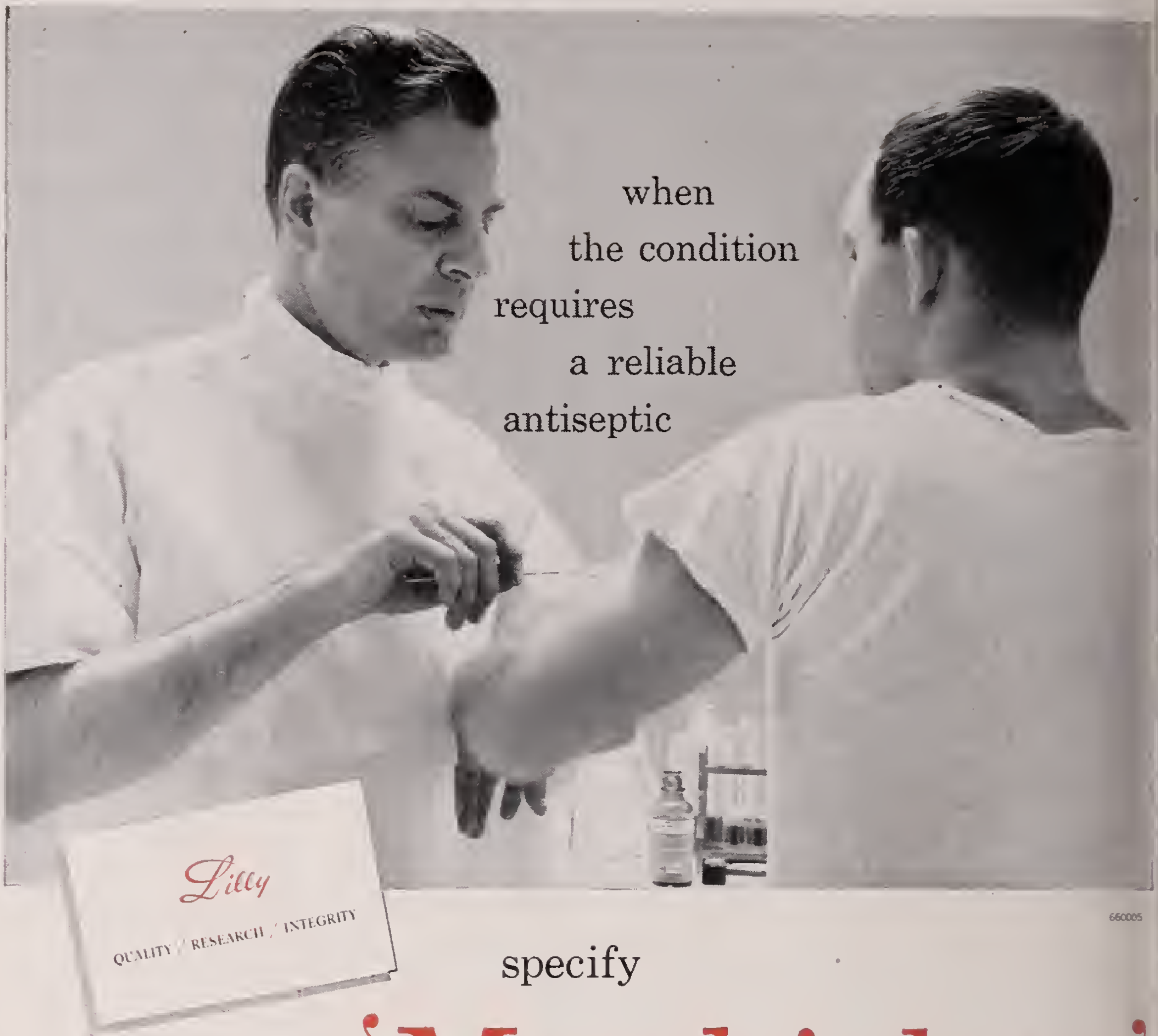
neomycin in addition to prednisolone, free alcohol —for protective coverage against virtually all pathogenic skin bacteria with a well-tolerated, *topical* antibiotic.

formula: Each gram of water-washable METI-DERM Ointment with Neomycin contains 5 mg. (0.5%) prednisolone, and 5 mg. (0.5%) neomycin sulfate equivalent to 3.5 mg. neomycin base.

packaging: METI-DERM Ointment with Neomycin, 10 Gm. tube.

Schering

MD-J-656


when
the condition
requires
a reliable
antiseptic
Lilly
QUALITY / RESEARCH / INTEGRITY
660005

specify

'Merthiolate'

(THIMEROSAL, LILLY)

'Merthiolate' is highly active under virtually all conditions; is relatively nonirritating and nontoxic

'Merthiolate' is germicidal in dilutions up to 1:4,000 in serum media and is relatively nonirritating in the concentrations suggested for use. It also maintains its activity in the presence of soaps. The fact that 'Merthiolate' is used as a bacteriostatic agent in fluids for parenteral administration gives strong evidence of its safety.

ELI LILLY AND COMPANY

80TH *ANNIVERSARY 1876 • 1956*

Original Contributions

Differential Diagnosis of Acute Poliomyelitis

Four-Year Study of 717 Cases of Suspect Poliomyelitis

T. C. PAPERMASTER, M.D.
Minneapolis, Minnesota

THE Elizabeth Kenny Institute is a unique hospital in that it specializes in one disease.* The ar 1952 brought the greatest deluge of patients Elizabeth Kenny Institute in the history of e hospital. The clinical material was referred practitioners throughout the Northwest area, cluding North Dakota, South Dakota, Minneta, Wisconsin and Iowa. When the patient arved at our Receiving Room, a history was taken, ysical examination was performed by the medil staff, and a spinal puncture was done if it as deemed necessary, or if it had not been done the referring doctor. If poliomyelitis could be led out at the initial contact, the family physian was called and the patient was sent either me or to another hospital with the approval of e family physician. By far, the greatest percentge of these people went home and were given llow-up care by the private doctor. A second oup of patients, in whom the diagnosis was more scure, was admitted to the Elizabeth Kenny stitute for further investigative procedures and, fter that, if poliomyelitis could be excluded, the atient was sent elsewhere according to the wishes f the family doctor. The author became curious to what happened to the individuals in whom at disease was ruled out. Letters were sent to ferring physicians and to other hospitals reuesting a final diagnosis on those patients. A milar technique was carried out for the years 953, 1954 and 1955. This study presents a review f 717 patients who did not have poliomyelitis

It was the belief of our staff that the listing of the disease entities in this series would make a "field study" of the differential diagnosis of poliomyelitis. This sort of thing had been done in the past,[1,2,3,4] and the only justification for this review is that it is a large series and it is of interest to the physicians practicing in this area who were kind enough to refer these patients. It will not be within the scope of this paper to discuss poliomyelitis itself, its symptomatology nor the literature.

No claim for absolute accuracy can be made, for the diagnoses in a large measure are dependent on the exactness of individual family physicians in diagnosing the patient at hand. The author, therefore, was forced to accept on its face value the report rendered to him by letter of the individual practitioner regardless of what his actual follow-up technique may have been. Those patients who were sent to other hospitals in the area for a more thorough investigation, particularly at the University Hospitals, Veterans Hospital and Minneapolis General Hospital, probably represent a more precise appraisal of the clinical state.

In addition, a few cases each year showed up in which the diagnosis was doubtful, and the patient was sent out only to have poliomyelitis confirmed elsewhere by further follow-up observations.

During the four-year period under consideration, 2,992 patients were sent to this hospital. Of these, 2,275 had acute poliomyelitis and 717 had some other disease, a ratio in the magnitude of three poliomyelitis to one non-poliomyelitis patient.

Table I represents the distribution according to age. It may be pointed out that 64 per cent of our poliomyelitis patients were in the age group below fifteen years and 61 per cent of our revised diagnoses of non-poliomyelitis patients were in the group below fifteen years.

From the Medical Service, Elizabeth Kenny Institute, inneapolis. E. J. Huenekens, M.D., Chief of Staff.

*The facilities of Elizabeth Kenny Institute were exanded in 1955 to include other neuromuscular disorders r rehabilitation. However, for the purposes of this aper the acute poliomyelitis suspects only were considred. The "acute" poliomyelitis patients we have arbiarily defined as those patients seen on or before the 4th day of the onset of symptoms.

Table II illustrates the distribution of cases according to the months of the year in which admission occurred. The interesting phenomenon here is that during many months of the year more non-poliomyelitis cases were seen than poliomyelitis cases. The high incidence of both groups occurring in July, August, September and October is parallel with the general experience with this disease.

TABLE I. DISTRIBUTION BY AGE

	1952		1953		1954		1955		Totals	
	P	NP	P	NP	P	NP	P	NP	P	NP
Birth to 1 year	23	9	10	8	9	2	3	5	45	24
1 to 4	227	32	98	43	48	40	37	32	410	147
5 to 9	312	51	186	44	57	43	51	47	606	185
10 to 14	172	20	123	28	48	20	50	14	393	82
15 to 19	93	24	58	23	24	17	32	17	207	81
20 to 29	159	31	120	31	42	26	52	11	373	99
30 to 39	80	20	60	16	27	9	26	14	193	59
40 to 49	17	5	7	7	6	3	2	3	32	18
50 and over	8	3	4	8	0	3	4	2	16	16
Unknown	0	3	0	1	0	2	0	0	0	6
Totals	1091	198	666	209	261	165	257	145	2275	717

P—Poliomyelitis
NP—Non-Poliomyelitis

TABLE II. DISTRIBUTION BY MONTHS

	1952		1953		1954		1955		Totals	
	P	NP	P	NP	P	NP	P	NP	P	NP
January	16	4	5	4	2	3	3	3	26	14
February	4	6	3	1	0	4	1	1	8	12
March	2	5	1	2	0	8	3	7	6	22
April	0	3	1	2	2	2	0	11	3	18
May	0	8	2	7	0	13	3	11	5	39
June	6	5	10	6	1	14	3	14	20	39
July	79	17	84	33	28	32	20	24	211	106
August	355	64	243	72	85	33	119	40	802	209
September	332	23	198	44	91	32	58	19	679	118
October	197	32	67	26	37	15	36	8	337	81
November	75	25	43	7	8	7	8	5	134	44
December	25	6	9	5	7	2	3	2	44	15
Totals	1091	198	666	209	261	165	257	145	2275	717

P—Poliomyelitis
NP—Non-Poliomyelitis

TABLE III. DISTRIBUTION BY SEX

	1952		1953		1954		1955		Totals	
	P	NP	P	NP	P	NP	P	NP	P	NP
Male	618	90	370	96	144	89	152	78	1284	353
Female	473	108	296	113	117	76	105	67	991	364
Totals	1091	198	666	209	261	165	257	145	2275	717

P—Poliomyelitis
NP—Non-Poliomeylitis

Table III compares the sex ratio of our poliomyelitis patients and non-poliomyelitis patients. We had a distinct preponderance of male patients who had poliomyelitis. However, in the suspect cases, the ratio was approximately equal.

Categories of Disease

Table IV portrays a large group of patients in whom a wide variety of diseases and organ systems produced symptoms which led to referral to Eli abeth Kenny Institute. The largest percenta of this group are patients in whom there was fai ure to find any specific illness. A few in this s called undetermined group were actually well chi dren who were referred because of suggestive con plaint associated with poliomyelitis exposure. Som were instances where no follow-up data could b obtained from the family physician and our ow data were not conclusive enough. A small numbe of individuals in this group were thoroughly ir vestigated and still an indeterminate conclusio was reached. It cannot be denied that some these could have been abortive poliomyelitis.

Respiratory diseases (Table V) comprised abo 37.7 per cent of the total group. A category whic includes the following terms: influenza, "flu-like illness, nonspecific upper respiratory infection, v

TABLE IV. MISCELLANEOUS

	1952	1953	1954	1955	Total
Undetermined or no disease found	60	47	36	23	166
Acute rheumatic fever	6	2	3	2	13
Urinary tract infection	1	3	3	1	8
Gastroenteritis	3	5	3	5	16
Shigellosis	0	0	1	0	1
Typhoid	0	1	0	0	1
Infectious mononucleosis	2	3	2	0	7
Hepatitis	1	1	0	0	2
Pleurodynia	1	0	0	0	1
Periarteritis nodosa	1	0	0	0	1
Iliac adenitis	1	0	0	0	1
Sepsis	0	1	0	1	2
Scurvy	0	1	0	0	1
Myocardial infarction	0	1	0	0	1
Abcessed teeth	0	1	0	0	1
Furuncle on buttock	0	1	0	0	1
Allergic reaction	0	0	0	1	1
Mumps	0	0	0	1	1
Measles	1	0	0	0	1
German measles	1	2	0	0	3
Roseola	3	0	0	0	3
Totals	81	69	48	34	232

TABLE V. RESPIRATORY DISEASE

	1952	1953	1954	1955	Total
Influenza— "Flu"-like illness, non-specific upper respiratory infection, "virus", infection, sinusitis	41	64	21	14	140
Tonsillitis and pharyngitis	13	17	26	22	78
Cervical adenitis	4	0	1	0	5
Otitis media	4	2	2	2	10
Pneumonia	3	3	6	4	16
Bronchitis	0	3	0	0	3
Asthma	2	2	0	0	4
Laryngitis	2	1	0	0	3
Laryngotracheitis	0	0	0	1	1
Croup	1	0	0	0	1
Herpangina	0	4	1	3	8
Peritonsillar abscess	0	0	1	0	1
Totals	70	96	58	46	270

s infection, and sinusitis were all lumped to-ther. This is, admittedly, an inaccurate and ob-ure type of situation. However, these are the act terms received from the physicians who re-lied to our questionnaires. This can be appreci-ted only by one who practices general medicine r pediatrics and is well illustrated by a letter eceived from one of the prominent pediatricians f Minneapolis who stated concerning one of his atients that "Stephen . . . apparently had one of hese crazy virus infections. He improved on anti-iotics and is apparently entirely well."

The group labelled tonsillitis and pharyngitis as limited to those in which exudate and red-ess of the structures involved enabled one to ake a more specific diagnosis. One syndrome oc-urring in this group forms a minimum number of ases statistically, although it would be found a reat deal more if practitioners were aware of the linical symptomatology. Herpangina caused by he Coxsackie virus is a July-August-September isease having abrupt onset of fever, headache and sore throat which early may be indistinguishable from poliomyelitis. However, on the second, third and fourth day of the disease, the typical lesions with vesicles and ulcers appear on the anterior pillars and soft palate. When these lesions become manifest, the symptoms are usually gone and as a result the patient may not consult the physician when he is feeling better. Familiarity with this disease would minimize error in diagnosing poliomyelitis. However, we are also aware that Coxsackie disease and poliomyelitis may exist together in a patient, and each virus can be grown out of stool and throat washings.

The forty-five cases of orthopedic disabilities demonstrated in Table VI comprised about 6.5 per cent of our revised diagnoses, and most of these were brought in because of limb pain or back pain.

The psychiatric group in Table VII is the smallest one. However, an emotional component does occur in every individual with an illness. These patients are singled out because the emotional part of the disease was the dominant one. All of these cases occurred in the second and third decade female, except for one ten-year-old male with an anxiety reaction and a fifteen-year-old male with petit mal.

TABLE VI. ORTHOPEDIC

	1952	1953	1954	1955	Total
Myositis (myalgia)	7	3	1	0	11
Myositis, of cervical erector spinae	0	0	2	0	2
Rheumatoid arthritis	4	0	0	0	4
Rheumatoid arthritis, hip	0	1	0	0	1
Ruptured intervertebral disc	2	0	1	1	4
Synovitis, leg	0	1	1	0	2
Back, sprain	2	0	0	0	2
Back, pain, cause not known	0	0	1	0	1
Torticollis	1	1	0	0	2
Legg-Perthes	1	1	0	0	2
Tendonitis of shoulder	0	1	0	0	1
Bursitis of shoulder	1	0	1	0	2
Knee injury	1	0	0	0	1
Leg trauma (hip)	0	0	2	0	2
Osteomyelitis, tibia	1	0	0	0	1
Osteomyelitis, calcaneous	0	1	0	0	1
Osteomyelitis, humerus	0	0	0	1	1
Ewing's sarcoma	0	1	0	0	1
Leg lymphedema	0	1	0	0	1
Muscle bruises	0	0	1	0	1
Epiphysitis, right capital femoral	0	0	0	1	1
Osteochondritis, left distal femoral epiphysis	0	0	0	1	1
Third degree burns of leg	0	0	0	1	1
Totals	20	11	10	5	46

TABLE VII. PSYCHIATRIC

	1952	1953	1954	1955	Total
Petit mal	1	0	0	0	1
Psychoneurosis	1	0	0	0	1
Hysteria	1	1	2	0	4
Malingering	0	1	0	0	1
Hysterical paralysis	0	0	0	2	2
Psychophysiologic disturbance with musculo-skeletal reaction	0	1	0	0	1
Conversion reaction with hyperventilation syndrome	0	1	1	0	2
Anxiety reaction	0	0	2	1	3
Totals	3	4	5	3	15

Of course, the most varied and interesting list of patients fall in the neurological disorders in Table VIII. and the author has subdivided them into infectious, neuropathies, vascular, traumatic, neoplastic and miscellaneous. Of the total, 21.5 per cent fall in this group. For some unknown reason, the years 1954 and 1955 brought the largest number of mumps meningo-encephalitis cases to confuse us. It was often necessary to await laboratory studies to give us the correct diagnosis in the case of lymphocytic choriomeningitis, western equine encephalitis, and mumps meningo-encephalitis (without parotitis).

One other interesting case deserves additional comment. A girl of eighteen years came in with central nervous system symptoms (headache, fever, stiff neck and back, sore throat) and a spinal fluid cell count of 8; protein 38 mg. per cent. Type 2 poliomyelitis was grown out of her stoo and she was discharged with a diagnosis of no paralytic poliomyelitis after a fifteen-day hospi stay. However, three weeks later, the vir neutralizing antibodies against lymphocyt choriomeningitis showed a rise from 31 to 70 Therefore, in this peculiar instance, we we forced to make two diagnoses; this case is n included in our listing.

Comment

In reading over the panel of diagno imitating poliomyelitis, the reader may feel th it would be almost ludicrous to confuse certain these entities with poliomyelitis. Indeed, care history and physical examination could ha avoided an unnecessary trip for some patien However, an unreasonable suspicion of pol myelitis occurred in a minimum of instanc Errors in over-diagnosing poliomyelitis are und standable with public pressure to contend wit and sometimes consultation with a center such Kenny Institute becomes a "must" during t se on. An example of this is demonstrated by a tter from a general practitioner in a small M nesota town on a 1952 non-polio patient who w te, “I think we were a little too polio minded. e should have kept her home but . . . there is too much heat on.”

We also had the experience of doing repeat inal taps after the referring physicians had done a diagnostic puncture elsewhere, revealing elevated cell counts. To our surprise, many of our repeat counts have been in the normal range or much lower than that reported by the referring family doctor. Our interpretation to explain this discrepancy has been that the referring doctor or technician counted red cells and did not distinguish red from white in the chamber, or else the

TABLE VIII. NEUROLOGICAL DISORDERS

	1952	1953	1954	1955	Total
Neurological—Infectious					
Meningitis					
Aseptic with otitis and mastoiditis	0	0	0	1	1
Organism unknown	4	2	2	1	9
Pneumococcus	1 Type 1	0	0	1 Type 6	2
H. influenza	0	2	1	2	5
Meningococcus	0	3	6	1	10
Strep	0	0	0	1	1
Staph	0	0	0	1	1
Aseptic	0	0	0	5	5
Meningismus					
Cause not known	0	0	1	3	4
Post measles	0	0	0	1	1
Lymphocytic choriomeningitis	0	0	1	5	6
Meningo-encephalitis					
Cause not known	2	0	0	3	5
Mumps	2	1	15	18	36
Encephalopathy					
Secondary to U.R.I.	0	0	0	1	1
With pertussis	0	0	0	1	1
Encephalitis					
Measles	1	0	0	0	1
Chickenpox	0	1	0	0	1
Influenza	0	1	0	0	1
Unknown	0	10	2	2	14
Western equine	0	0	2	0	2
Totals	10	20	30	47	107
Neurological—Neuropathies					
Guillain-Barre	1	2	0	1	4
Transverse myelitis	1	1	0	1	3
Polyneuritis	0	1	2	0	3
Bell's palsy	1	0	1	0	2
Erb's palsy	1	0	0	0	1
Paralysis of arms, cause unknown	1	0	0	0	1
Radiculitis	0	0	0	1	1
Bulbar paralysis, cause unknown	0	0	0	1	1
Totals	5	4	3	4	16
Neurological—Vascular					
Hematomyelia	1	0	0	0	1
Cerebral vascular accident	1	1	0	1	3
Thrombosis of post inferior cerebellar artery	0	0	0	1	1
Totals	2	1	0	2	5
Neurological—Traumatic					
Head injury	1	0	0	0	1
Skull fracture	0	0	1	0	1
Totals	1	0	1	0	2
Neurological—Neoplastic					
Spinal cord tumor	4	0	2	0	6
Brain tumor	1	0	2	1	4
Totals	5	0	4	1	10
Neurological—Miscellaneous					
Convulsive disorder	0	1	1	0	2
Tetanus	1	1	1	0	3
Muscular dystrophy	0	1	0	0	1
Extradural abscess	0	0	1	0	1
Hemiparesis with U.R.I.	0	0	1	0	1
Headache, cause unknown	0	0	1	0	1
Herpes Zoster	0	0	0	2	2
CNS syphilis					
Meningovascular	0	1	0	0	1
Tabes dorsalis	0	1	0	0	1
Hydrocephalus with arachnoid adhesions	0	0	0	1	1
Totals	1	5	5	3	14
Neurological Total					154

cell count obtained off the chamber was multiplied by the wrong factor, consequently the exaggerated figure.

Summary

1. A review of 717 cases of suspect poliomyelitis, in which a revised diagnosis was made, is presented, covering a four-year period of admissions at Elizabeth Kenny Institute from 1952 through 1955. The disease categories are listed in tables.

2. Errors in diagnosing poliomyelitis may be minimized by the following methods:

(a) A careful history and physical examination.

(b) Familiarity with other disease entities which may be epidemic at the time that poliomyelitis is existing in the population. Examples of such diseases are: herpangina, roseola, and acute gastroenteritis.

(c) Care in the performance of a spinal puncture and in the examination of the resulting spinal fluid.

3. The important lesson to be learned here is that poliomyelitis in its early stages with bo line findings may be indistinguishable from diseases in a vast spectrum. If, therefore, myelitis can confound the experts often unt virus is grown out of stool cultures or sufficient time has elapsed for serological da be obtained, it is certainly reasonable to e that many times the average medical practi who carries the greatest burden of patient may be at a loss, during the stress of the hou supply a diagnosis on a given patient. He find it convenient and desirable to seek help a center.

Bibliography

1. Britt, R., Christie, A., and Batson, R.: Pitfa the diagnosis of poliomyelitis. J.A.M.A., 154 (April 24) 1954.
2. Blattner, J.: Recent advances in clinical aspe poliomyelitis. J.A.M.A., 156:9 (Sept. 4) 195
3. Hedenstrom, F. G.: Review of poliomyelit Ancker Hospital from 1931 to 1951. Minn Med., 35:842, 1952.
4. Dawson, K. E., LaBoccetta, A. C., Torray, and Silverstein, A.: Acute poliomyelitis. Diff tial diagnosis of 409 revised diagnoses. J. Pedia 40:71 (Jan.) 1952.

N-ACETYL-P-AMINOPHENOL (TYLENOL ELIXIR) AS A PEDIATRIC ANTIPYRETIC-ANALGESIC

This study was concerned with pediatric clinical conditions in which an analgesic-antipyretic drug would be indicated, and evaluation of chronic toxic reaction.

Tylenol, an elixir containing 120 mg. N-acetyl-p-aminophenol per 5 cc., was administered to 121 infants and children with fever, pain, irritability and other symptoms of discomfort associated with a variety of upper respiratory and other infections (a total of twenty diagnoses.) In ninety-six of the patients antibiotics or sulfonamides were also used. Tylenol was administered for periods of one to nine days, the majority of the children requiring treatment for one to four days.

In this group Tylenol "produced effective antipyretic and analgesic responses and no evidence of side-effects that could be attributed to the medication."

An additional group of twenty hospitalized infants and children with tuberculosis were given Tylenol over a period of five weeks to determine its safety on longed use. In this group the total amount of drug given to children under six years of age was mg. (8 grains) per day; children over six rece 960 mg. (16 grains) per day.

This prolonged administration produced no und able side-effects and had no effect on the hemogl concentration, total leukocyte count or differential kocyte count. Special tests in five of these fe patients indicated that prolonged administration Tylenol had no effect on the prothrombin, bleedin coagulation time.

In the entire series of 141 patients, Tylenol considered "acceptable" or "liked" by 86 per cen the children.—Cornely, D. A. and Ritter, J. J.A.M.A., 160:1219 (April 7) 1956.

uction of the Endocrine Organs during the toperative Period

E. DAHL-IVERSEN
Copenhagen, Denmark

RING the postoperative period practically ll patients present a change in the normal drine balance. During recent years a group y co-workers, E. Hasner, I. Engdahl, H. a, B. Sorensen, T. Tobiassen, and I have d this condition.

e changes occuring during the postoperative l are independent of the nature of the opera- as only very small interferences are possible ut a change in homeostasis. Attempting to 1 as uniform conditions as possible, we have nd foremost used a series of cases subjected stric resection in our pathophysiological in- ations. The clinical observations of the omatology of the postoperative period are upon 871 patients subjected to widely ent operations, with a postoperative course ng from the mildest to the severest degrees, were fatal in some few cases. The patho- ological investigations were made in 200

cording to our investigations, sex and age no influence on the metabolic changes during postoperative period.

anges caused by anesthesia are of quite short ion, and begin soon after anesthesia has been ed, having largely subsided when the actual, perative changes can be recorded.

e clinical picture developing after an opera- will generally be manifest from two to six after the commencement of the operation. considered that it would be expedient to e the postoperative clinical picture into three s: mild, medium severe, and severe cases.

ble I shows the criteria on which we have l this classification. Many objections may be against such a classification, but it is based a comparison between the clinical pictures and the recorded pathophysiological reactions in the great number of cases I mentioned.

TABLE I.

Mild cases:
Rise of temperature to 38.5° for up to 5 days.
Increase of pulse-rate to 100 for up to 3 days.
Output of urine exceeding 350 ml. after 24 hours.
Respiratory rate not exceeding 20.
Intestinal passage suspended for 24 hours.
Blood pressure over 100 mm. Hg systolic.

Medium severe cases:
Rise of temperature to 39.5° for up to 5 days.
Increase of pulse-rate to 120 for up to 3 days.
Output of urine exceeding 150 ml. after 24 hours.
Respiratory rate not exceeding 25.
Intestinal passage suspended for up to 5 days.
Blood pressure over 100 mm. Hg systolic.

Severe cases:
All cases not belonging in the two preceding groups.

Considering the number of symptoms from the gastrointestinal tract, the circulation, respiration, urinary tract, from the nervous system, the psyche, the skin, the mucous membranes and the eyes, and considering the temperature which is observed during the postoperative period, the postoperative clinical picture in severe protracted cases presents numerous features in common with the pathophysiological responses in adrenal cortex insufficiency, whereas pictures resembling that of pituitary insufficiency develop only in the rarest cases.

The postoperative adrenal cortex function was investigated by systematic registration of the quantitative and qualitative changes in the excretion in the urine of 17-ketosteroids, corticoids and dehydroisoandrosterone, and by eosinophil counts in the blood.

The experimental period began three days before the operation and was generally concluded eight days after this. In complicated cases it was prolonged.

With regard to 17-ketosteroids, the preoperative average levels were somewhat lower than the average values stated by Hamburger, though within normal limits (Fig. 1).

---

sented before the Saint Paul Surgical Society, Paul, Minnesota, November 9, 1955.

led by grants from "Statens almindelige Viden- fond," "Kong Christian den X Fond" and "Nordisk infond."

This also applies to the findings in the case of the corticoids. The explanation is, inter alia, that most of our patients suffered from diseases of chronic nature, and according to investigations of recent years such patients have a lower excretion of these substances than under normal conditions.

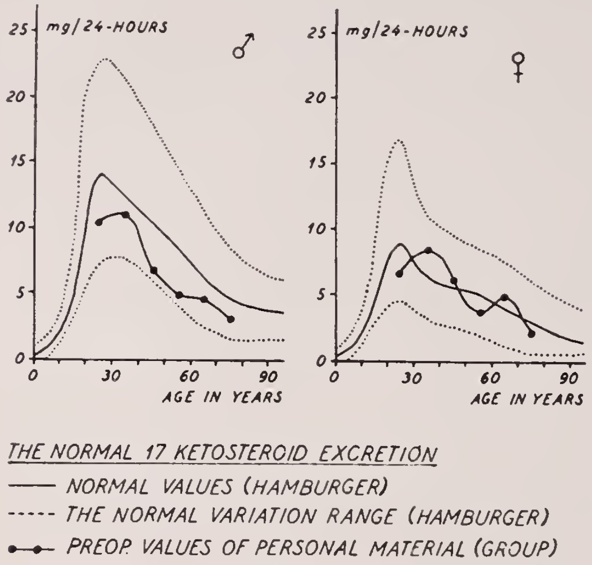


Fig. 1.

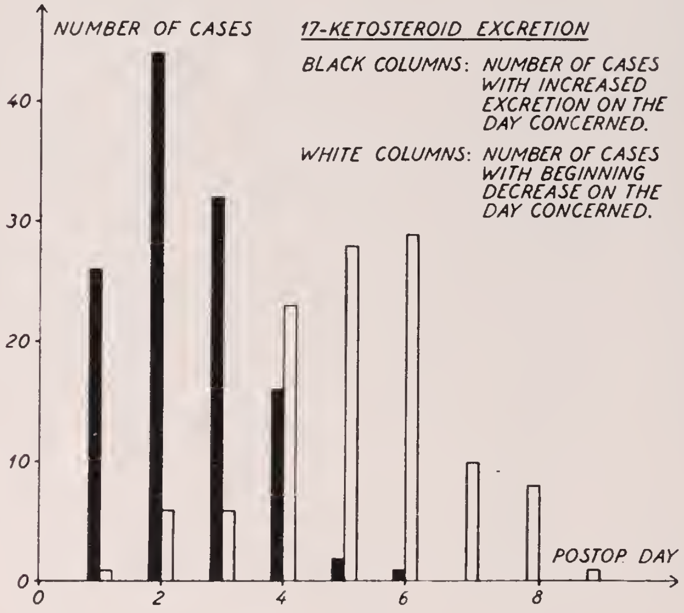


Fig. 2.

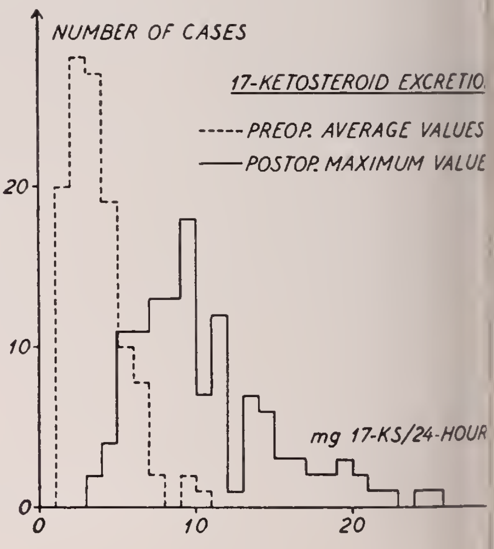


Fig. 3.

The investigations of the postoperative 17-ketosteroid excretion comprised 200 cases; in 140, i.e., about two-thirds, there was a significant rise, i.e., one exceeding 50 per cent. The increased excretion may commence in the course of the first four or five hours, but in most cases it does not occur until about the second or third y. The excretion falls to normal again between ıe third and ninth days, most frequently from ıe fifth to sixth day (Figs. 2 and 3).

In a number of cases the postoperative in al rise is followed by a fall below the preopera ve level.

The one-third of patients who showed o significant rise in the 17-ketosteroid excretior ll had postoperative eosinopenia and a significa y increased corticoid and dehydroisoandrostei e excretion. On the whole it appeared that the 7-ketosteroid excretion is the least sensitive indic or of an increased adrenal cortex function.

The corticoids of the urine originate chiefl or exclusively from the adrenal cortex, in cont st with the 17-ketosteroids which are also prod d in the testes. Two biologically active cortic s, 17-hydroxycorticosterone and cortisone, have t n isolated from the urine.

Within the first twenty-four hours after surg al interference or some other form of stress e corticoid excretion in the urine increases in e great majority of cases; in only few cases e rise in the excretion does not appear until e second or third day. The corticoid excretion f s to normal again between the second and si h days, in the great majority of cases between e second and third. Our series includes fifty c s examined to the same extent as in the case f 17-ketosteroids (Figs. 4 and 5).

here was a significant rise in all our cases, a rise of more than 50 per cent. In a number ases the corticoid excretion also showed a al below the preoperative level after the post- ative initial rise. After a few days the coid excretion rises again to the normal level. ulated in per cent the increase in the corticoid etion is more pronounced than the corre- ding rise in 17-ketosteroids, and the former more rapidly than the latter but also fall e rapidly. The corticoid excretion must be idered a more sensitive indicator of the nal cortex function than the 17-ketosteroid etion.

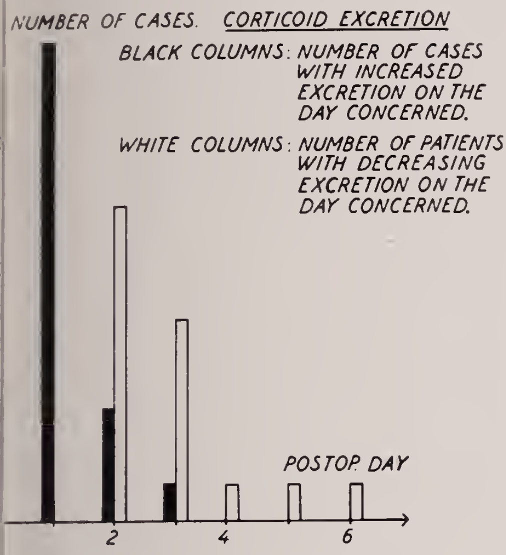


Fig. 4.

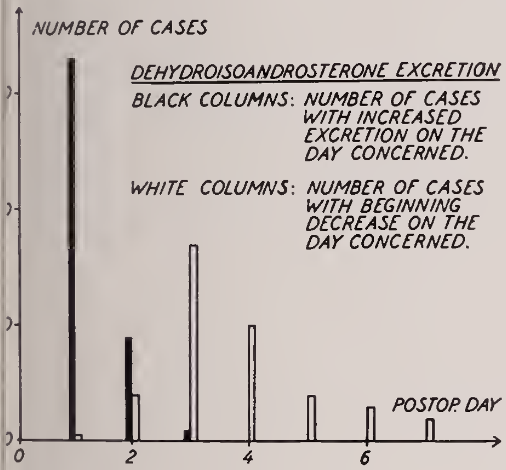


Fig. 6.

The dehydroisoandrosterone excretion also proved to give a valuable expression of the adrenal cortex function following surgical interference, and is apparently a sensitive indicator of this function. Dehydroisoandrosterone is also chiefly or exclusively produced in the adrenal cortex. The excretion was determined in ninety patients. In eighty-two there was a significant rise of over 50 per cent.

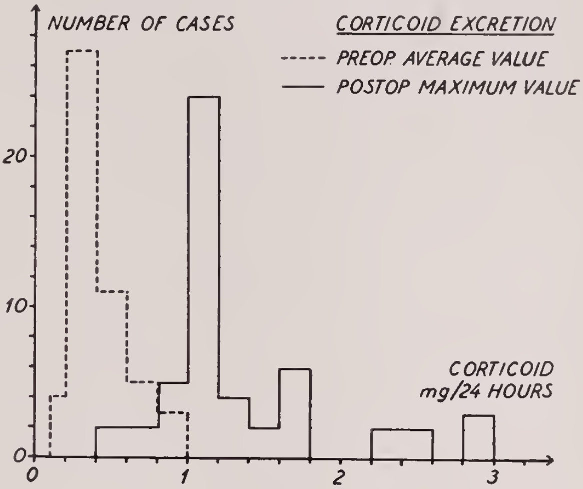


Fig. 5.

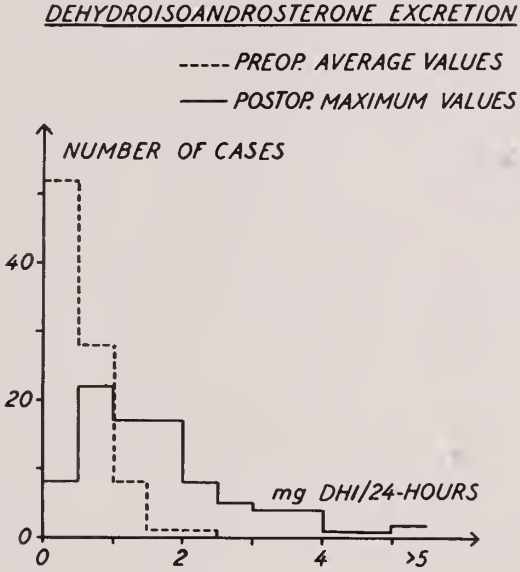


Fig. 7.

Figure 6 shows the time of onset and cessation of the increased excretion, and Figure 7 gives the preoperative and postoperative values.

In the great majority of cases the excretion rises during the first twenty-four hours, falling again from the third to the seventh day, in a few cases below the preoperative level. As in the case of the corticoids the rise in per cent was more pronounced than that of the 17-ketosteroids.

We consider that the increased hormone excretion in the urine during the postoperative period which we have demonstrated in these investigations must be regarded as indicative of an increased adrenal cortex function. A comparison between the rises in the three hormone fractions whose excretion has been investigated shows that the significantly increased postoperative excretion amounted to 65 per cent, 80 per cent and 91 per cent for 17-ketosteroids, corticoids and dehydroisoandrosterone, respectively.

We have termed this increased adrenal cortex function the *primary, increased adrenal cortex function*.

Investigations on 17-hydroxycorticosterone in the blood performed by other authors in a smaller number of cases show results similar to those found in investigations on adrenocortical hormone excretion in the urine, and examinations of saliva which we have undertaken gave similar results.

In a number of cases a secondary rise occurred in the excretion of the three hormone fractions: *a secondary, increased adrenal cortex function.* The time of onset of this rise varied much; among the various causes that may produce such a rise we stopped to consider complications, which were the cause of the increased excretion in 50 per cent of the cases. In contrast with the primary rise the secondary rise occurred rapidly, in many cases before the complication could be ascertained clinically. The complications causing the secondary rise were of a serious nature.

In twenty cases we ascertained an increased excretion of the hormone fractions concerned beyond the ninth day; in all these cases the postoperative course was seriously complicated, and a few cases were fatal. We have termed this last-mentioned form of increased adrenal cortex function: *protracted, increased adrenal cortex function.*

Increased adrenal cortex function with the above-mentioned changes in the excretion of hormones is also associated with eosinopenia, which follows the changes in the hormone excretion; such a simple method of examination may thus indirectly afford a measure of the adrenal cortex function.

We performed eosinophil counts in 300 of the cases; in 288 we found a fall to under 50, ar in 276 to zero. We attribute great importance to he almost constant fall to zero, as the great erro n counting occurring in these counts is of no p ctical importance owing to this finding. e number of eosinophils during the postoper period is thus a very sensitive indicator of creased adrenal cortex function.

The eosinopenia commences about half an after the beginning of the operation, and rea maximum from four to five hours later. In ncomplicated cases it persists for one or two and then rises to the preoperative level on average on the third day. The preoperative is re-established on the seventh day at the l t. With regard to duration, the postoper eosinopenia closely follows the increased excr on of hormones.

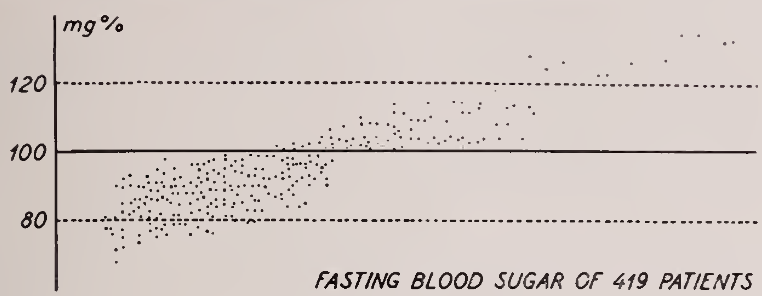
We examined in fifteen cases the possible e of cortisone on the postoperative adrenal c ex function by observing the excretion in the ne of 17-ketosteroids and dehydroisoandroster The dosage was 200 mg. of cortisone daily m three days before the operation to the sixth ay after, with gradually decreasing doses to the t th day. We found that cortisone reduces the xcretion of 17-ketosteroids, and causes an en more pronounced reduction of that of dehydr oandrosterone; but apparently cortisone ly inhibits the increased postoperative excretio there was a pronounced preoperative inhibi n

The increased adrenal cortex function is esumably the chief cause of the metabolic cha e occurring during the postoperative period, but he renal and hepatic functions must also be incl ed here in the pituitary-suprarenal axis system.

We performed a number of investigations on n potassium, sodium, chloride, protein, uric d creatinine and carbohydrate metabolism du ng the postoperative period in ninety-four pat (forty-three females and fifty-one males).

The potassium excretion in the urine wa ncreased postoperatively in all patients, causi a negative potassium balance. In 84 per cent he excretion rose already within the first twenty ur hours after the operation, and in the rest o he cases on the second postoperative day. There as a relation as to time but no quantitative rel on between the increased potassium excretion and he rise in the hormone excretion. In complic ed cases, secondary increased or protracted incre d potassium excretion was demonstrated, and ir.

cases the serum potassium level became low.
e excretion of sodium and of chloride was
ed postoperatively in all patients examined.



FASTING BLOOD SUGAR OF 419 PATIENTS

Fig. 8.

ion as to time or quantity with the post-
tive adrenocortical function could not be
nstrated either with regard to the excretion
dium or that of chloride. The serum sodium
proved subject to small changes only,
ally a fall, and no typical change in the serum
ide concentration occurred during the first
postoperative days.

ie increased potassium excretion in the urine
d in three days in 90 per cent of the cases,
in five days in all cases.

ie sodium retention began about the second
perative day and ceased about the fifth day.
ie chloride retention began about the third
perative day and ceased about the eighth

th the sodium and the chloride retention begin
and persist longer than the increased renal
ssium excretion.

ie nitrogen excretion was increased, and a
tive protein balance was found, lasting from
to ten days; increased uric acid and
inine excretions were also observed, lasting
the second to the sixth or eighth post-
ative day.

ie carbohydrate metabolism during the post-
ative period was examined by determinations
asting blood sugar, glucose tolerance tests,
nstration of any glucosuria, and by examina-
of the insulin sensitivity. The activity of the
reas can only be determined by these methods
indirect determination, which afford a
bility of deciding whether it is the pancreas
he other endocrine glands which determine
course of the carbohydrate metabolism post-
atively.

The fasting blood sugar was determined in 419 patients (Fig. 8).

By comparing this series of patients admitted to the department with a series of normal individuals it appeared that the blood sugar level during the whole of the preliminary period of investigation was in the lower part of the normal interval. During the same period, and in the same series, the adrenocortical hormone excretion was also in the lower part of the normal interval.

Postoperatively we found a significant rise in the fasting blood sugar level, beginning during the first twenty-four hours, in about 80 per cent of the cases.

The blood sugar level began to rise immediately after the commencement of the operation, and continued to rise in the course of the day. The initial rise was rather abrupt and presumably caused by adrenaline. The rise then continues more slowly and is now presumably part of the actual stress reaction.

In most cases the hyperglycemia ceased about the third or fourth day, in some not until the tenth day (Fig. 9). Figure 10 shows the preoperative and postoperative blood sugar values. The former are average values, the latter maximal levels.

In contrast with the hormone excretion the fasting blood sugar did not fall below the preoperative level after the operation.

In the case of the fasting blood sugar level, too, examples of secondary rise and protracted rise were seen. In 66 per cent of these cases the cause of the rise were complications, and the secondary hyperglycemia occurred in many cases before the complication could be demonstrated clinically. We found a protracted rise in twenty-three cases, and the postoperative course was seriously complicated in all.

Intravenous glucose tolerance tests were performed in thirty-eight cases; twenty-six of these were operated on, and another glucose tolerance test was made after the operation. Figure 11 shows the average curve from preoperative and postoperative glucose tolerance test. It appears that the maximal blood sugar value was higher postoperatively than preoperatively, averaging 261 mg. per 100 ml. The fall was fairly parallel with the preoperative one, though somewhat slower and stopping at a higher level, so that the original value was not reached in two hours. The curve in the postoperative period rather suggests a lowered combustion and increased gluconeogenesis. From the third to the sixth postoperative day, most frequently on the fourth, the curve becomes normal again. In the case of comp ations the curve did not become normal until e complication had been obviated. Hyperglyc ia was present in all cases with abnormal glu se tolerance curves. Figure 12 shows the indivi al values.

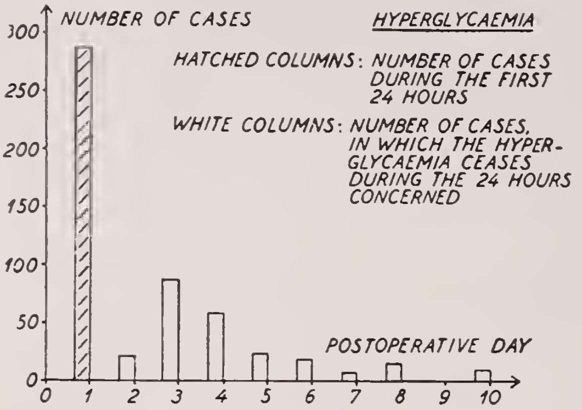


Fig. 9.

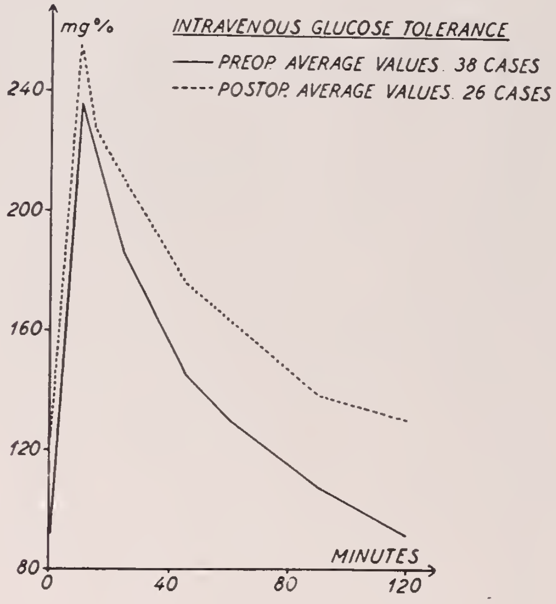


Fig. 11.

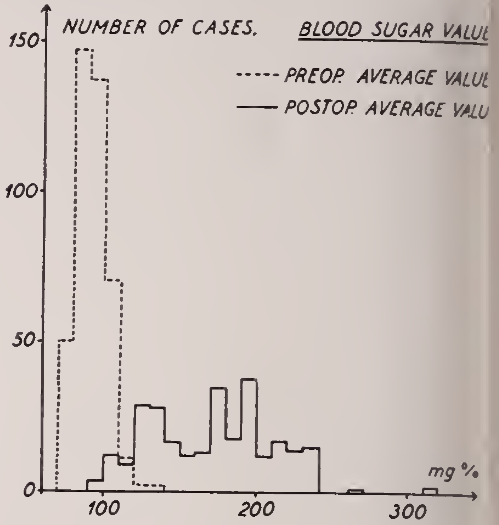


Fig. 10.

For the purpose of comparison, peroral glu se tolerance tests were performed in twelve c s (Fig. 13).

The preoperative and postoperative cu s differed but slightly from each other, the la r rising and falling more slowly. The alt d course of the curve in peroral tolerance test is probably due to the changed conditions of sorption, transportation, and a changed regula n mechanism on the whole.

Our investigations thus showed a transi y change in a diabetic direction of the carbohyd e metabolism after operation, and suggest that cose tolerance tests are more suitable as indic r of changes in the postoperative carbohyd e metabolism than determinations of the fas g blood sugar.

To obtain a knowledge of the factors cau g the changed postoperative carbohydrate me olism, we performed experiments on the ins n sensitivity before and after operation in sixty-t e cases. In fifty-four of these cases the test (2 in national units of plain insulin diluted to 2 injected intravenously pre- and postoperativ) showed a change in the hypoglycemic reactior s increased resistance to insulin occurred during e postoperative period; this was most pronour d ad most frequent on the second postoperative dy, and then decreased during the days that fowed, both in frequency and intensity. The adual reduction of the resistance ceased about t sixth postoperative day.

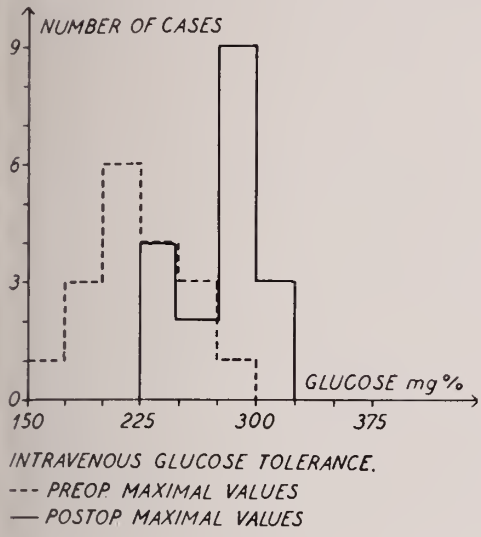


Fig. 12.

Finally we examined whether the administran of cortisone influenced the fasting blood sugar lels before and after operation, but found no monstrable changes in the carbohydrate metabsm; this may be due to the activity of the uitary-suprarenal axis system exerting maximal luence.

The pituitary gland, the suprarenal glands, the aries and the thyroid gland all influence the rbohydrate metabolism. In the case of the ncreas our results do not permit definite conisions, but apparently there is no increased ulin production, and any changes in the innal secretion of the pancreas do not influence carbohydrate metabolism during the posterative period.

Changes in the function of the parathyroids d of the gonads are hardly of any importance ring the postoperative period.

The changes in the function of the thyroid nd during the postoperative period seem to ggest hyperfunction, as there is a rise in the tabolic rate postoperatively. We measured the tabolism in twenty-one patients in connection th operation. Nineteen showed a rise already ring the first twenty-four hours, followed by fall to the original level on the third postoperative day in some cases, whereas the rise persisted in a number of cases during the whole experimental period of nine days. Another rise in the metabolism occurred if complications developed.

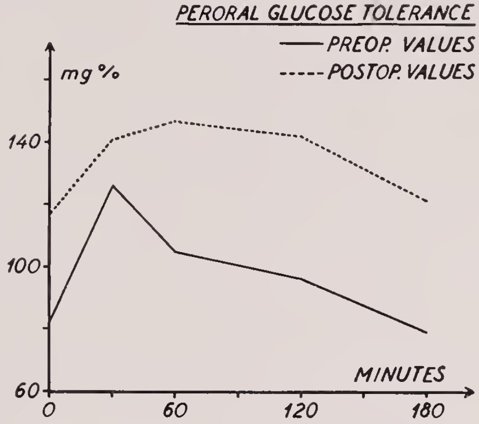


Fig. 13.

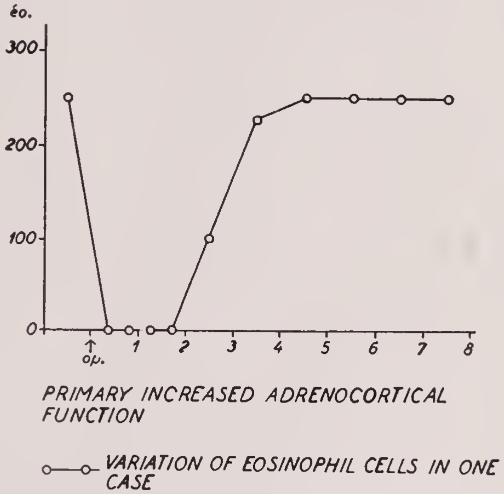


Fig. 14.

However, no direct conclusions with regard to the function of the thyroid gland can be drawn from the determinations of the metabolism only, but our investigations do not exclude the possibility of increased function. Other authors have demonstrated an antagonism between the adrenocortical and thyroid functions; to elucidate this antagonism we treated fifteen patients with cortisone before and after operation. We found that cortisone increased the energy transformation, so for this reason, too, no conclusions can be drawn with regard to the function of the thyroid from the determinations of the metabolism. Our investigations did not permit conclusions with regard to the mentioned antagonism between the adrenocortical and thyroid functions.

As already mentioned, three types of increased adrenocortical function can be established on the basis of our investigations: primary, secondary, and protracted increased adrenal cortex function. These are of importance in practical clinical work, as they can be distinguished and identified by such a simple method of examination as an eosinophil count, which is very, but not too sensitive for this purpose (Figs. 14, 15 and 16).

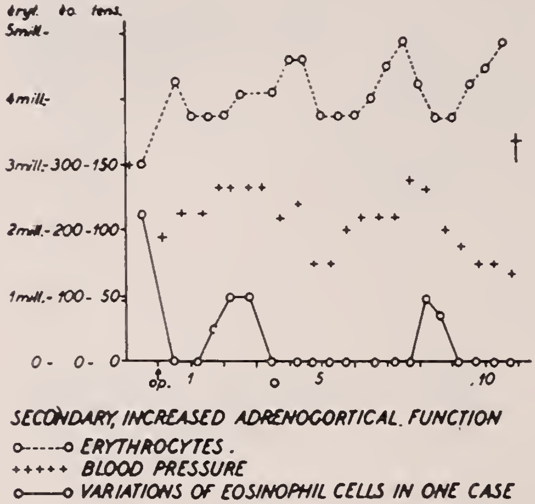


Fig. 15.

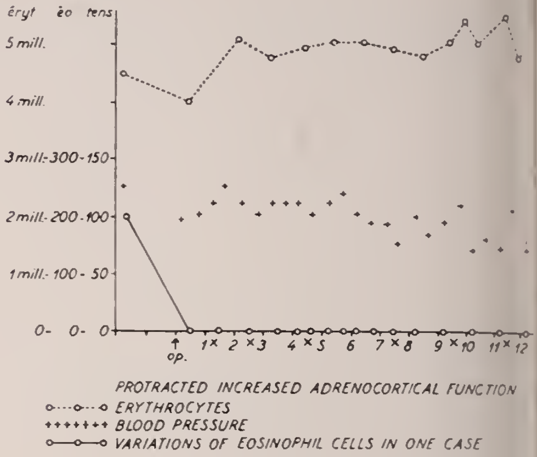


Fig. 16.

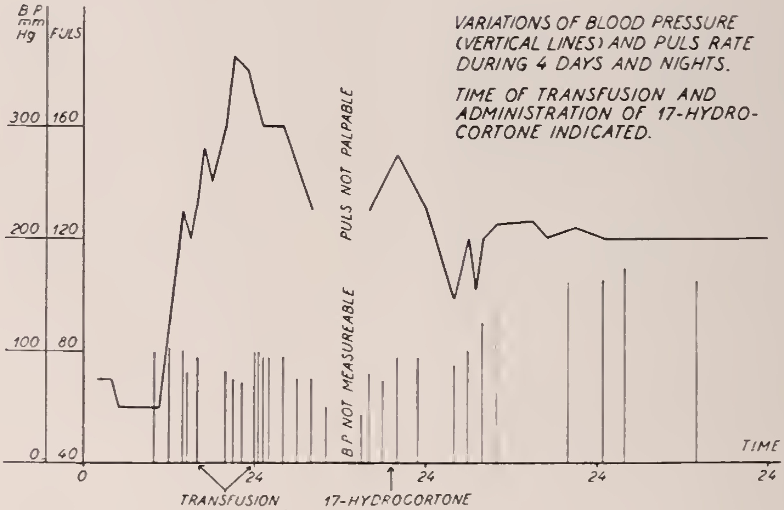


Fig. 17.

A secondary and a protracted increased adrenal cortex function occurs in conjunction with serious complications, and will often have set on before it has been managed to diagnose the complications clinically. It may therefore be of a certain diagnostic and possibly also prognostic importance o record the function of the adrenal cortex.

The changes in the metabolism during primary increased adrenocortical function clinically insignificant and require no treatme whereas the occurrence of secondary and especi of protracted increased adrenocortical funct requires observation of the water, protein electrolyte metabolisms of the patients, bec there is a risk of such pronounced deficits that these may become dangerous if they are properly dealt with. In cases with protrac hyperfunction we have observed a condition wh we chose to call postoperative asthenia or me bolic shock: The patient is in a very poor st

(Continued on Page 380)

ervical Traction and Other Physical Therapeutic rocedures for Pain about the Neck and Shoulders

DONALD J. ERICKSON, M.D.
Rochester, Minnesota

LARGE percentage of disabilities of the neck, shoulder and upper extremity are due to tation or compression of the cervical nerve ts or some of the components of the brachial xus. The physician may not be aware of the merous possibilities for compression which exist the region of the neck and shoulder. The st common disorders which produce signs and nptoms as a result of a mechanical irritation the nerves are osteoarthritis of the cervical rtion of the spinal column, protrusion of the vical disk, whiplash injury and the so-called tlet syndrome.

Jackson[1] has proposed the term "cervical syn- ome" to include most of the conditions which y be due to irritation of the cervical nerve ts or the cervical spinal nerves. Others have ggested the term "outlet or brachial plexus ndrome" for the conditions in which there is itation or compression of the nerves of the achial plexus.[2-4]

Pain in the region of the shoulder or in the m may be due to lesions of the cervical portion the spinal column as well as to lesions of the oulder joint.[5] The most important point in fferential diagnosis is the presence of local signs the shoulder, that is, both active and passive nitation of motion, either diffuse or localized nderness, or other signs of inflammation. In ses in which the shoulder joint is free of all ese signs, the primary cause of the trouble usually elsewhere. It must be remembered that a mber of lesions of the chest may also cause in in the shoulder and arm.

Anatomy

A knowledge of the functional anatomy of the rvical region is indispensable to the proper understanding of the mechanisms by which the cervical roots and plexus may sustain trauma by functional or anatomic variations from the usual.[6] The cervical portion of the spinal column allows a great range of motion in all directions. The seven cervical vertebrae enclose in their formed canal the eight cervical segments of the spinal cord and a variable portion of the upper thoracic segments.

The vertebra affords the greatest protection to the cord. The cord itself is relatively well protected in a bed of cerebrospinal fluid bounded by the arachnoid and dura mater. The junction of the second with the third cervical vetebra where the disk is thin is considered the weakest part of the spinal column, although this is not the part most liable to injury. The joints between the sixth and seventh cervical vertebrae allow the greatest mobility in the cervical region. However, the joints between the sixth and the fifth and between the fifth and the fourth cervical vertebrae are more vulnerable to injury than any other of these joints.[1] For example, when the neck is in hyperextension, the greatest strain is on the joints between the fourth and the fifth and stress is also on the joints between the fifth and the sixth vertebrae when the neck is in flexion.

A word of explanation is in order concerning the anatomic peculiarities of the cervical portion of the spinal column which has led to confusion in designating the level of neural, vertebral or intervertebral involvement. Since no disks are present between the occiput and the atlas or between the atlas and the axis, naming the disk involved by the number may be misleading. Thus, it seems desirable in specifying the level of involvement in the cervical region, especially when referring to a disk, to name the nerve involved or to specify the numbers of the adjoining vertebrae.[5]

According to Jackson,[1] there are small joints between the lateral portions of the bodies of the

---

Read at the meeting of the Southern Minnesota edical Association, Albert Lea, Minnesota, September . 1955.

From the Section of Physical Medicine and Rehabili- tion, Mayo Clinic and Mayo Foundation. The Mayo undation, Rochester, Minnesota, is a part of the raduate School of the University of Minnesota.

vertebrae which are called the "lateral intervertebral joints." Jackson considered them of great significance in the mechanism of irritation of cervical roots because of the close proximity to the nerve roots. The intervertebral foramina in the cervical portion of the spinal column are bony canals which are oval in shape and which have greater vertical diameter than anteroposterior diameter. An arthritic process may narrow the foramen so that the nerve root passing through may be irritated by the bony projections. The nerves leave the cord in the cervical region more nearly at a right angle than most lower nerve roots do, and they lie almost directly over the corresponding intervertebral disks. Therefore, a lateral protrusion of a cervical disk may compress a nerve root without damaging the cord.

This type of compression is now recognized as a rather frequent cause of brachial pain as first described by Semmes and Murphy.[7] In this situation it is easy to understand, as pointed out by Eaton,[2,3] how an increase of intrathoracic or intra-abdominal pressure may aggravate root pain because of the engorgement of the epidural venous plexus secondary to the interruption of the venous flow in the large vein. These engorged vessels press on or stretch the irritated nerve roots. The same author has stressed the accentuation in root pain which occurs during sleep. He attributed this to the lengthening of the spinal column that takes place when the body is in a horizontal position; this lengthening increases the pressure on the irritated nerve roots.

The seventh cervical nerve is considered to be the largest cervical root, and it supplies approximately the axis of the upper limb. When the limb is considered as a whole, it is readily seen that the fourth cervical and the first and second thoracic roots contribute to the sensory supply and there is definite overlapping. Thus, painful stimulation of a somatic region may cause reflex pain anywhere along the segmental distribution of the nerve or nerves which supply that particular region. For example, irritation of the dome of the diaphragm may cause pain in the arm on a reflex basis. Between the intervertebral foramina and the axilla are several other places where the nerve roots or plexus may be compressed by relatively minor anatomic variations. The underlying conditions may be grouped together and called the "outlet or brachial plexus syndrome."[2-4] These sites are the dorsal surface of the first rib rib attached to the seventh cervical vertebra, posterior margin of an abnormally tight, hyp trophied scalenus anterior muscle, the region tween the dorsal surface of the first rib and inferior surface of the clavicle, and the reg lying behind the pectoralis minor muscle a beneath the coracoid process. It has been kno for a long time that the shoulder girdle descer during development. There is more descent women than in men, and this, according to Tod would explain the greater frequency of sympto due to brachial pressure in women than in m It is interesting to note in this connection tl most of the maneuvers used to test compressi of the brachial plexus by the anterior scaler muscle will also increase compression when otl conditions of the outlet syndrome are present.

It is obvious, therefore, that many possibilit for compression of nerves exist in the neck a axillary region. Next, I shall consider in sor detail several of these entities and describe t use of various physical therapeutic procedures the treatment of these conditions with empha on home treatment.

Osteoarthritis

Osteoarthritis is a common cause of irritati of nerve roots. In 1925, Parker and Adso provided one of the earliest descriptions of e croachment by hypertrophic spurs on the spin foramina, causing irritation of the nerve roo with symptoms referred to the region of distrib tion of some of the efferent portions of the pa ticular nerves. Bony changes frequently occur osteoarthritis of the cervical segment of the spin column. These changes are found most often the lower cervical vertebrae from which emerg the sixth, seventh and eighth cervical nerves. is well to recall that these segments contain portion of fibers which supply the pectoralis maj and minor, the subscapularis and the deep portion of the latissimus dorsi muscles. If tl foramina from which these nerves emerge a narrowed, it can readily be understood how patient could have pain over the pectoral regio or the region of the shoulder and arm. Occasior ally, a patient will have osteoarthritis of th cervical portion of the spinal column and con plain of a dull ache largely confined to the regio of a shoulder and arm. The patient may n complain of pain in the neck but he may hav noted that certain movements of the neck, such as hyperextension, will produce pain in the region of the shoulder, arm or chest. However, when a patient complains of pain in the shoulder, in the arm or over the chest, it is well to keep in mind the fact that this pain may be due to osteoarthritis of the cervical vertebra.

The outstanding characteristic of this condition is the aggravation of all root symptoms by movement of the spinal column or by anything which tends to increase the pressure within the meninges. Sensory symptoms are common and almost all patients have pain or paresthesia. Physical examination may disclose decreased mobility of the cervical vertebrae, and crepitation is either audible or palpable over the back of the neck. Many of the patients complain of a grating sensation when they rotate their heads. Inasmuch as hypertrophic changes occur gradually over a long period and motion becomes limited, the nerve roots apparently sometimes accommodate to such foramina without symptoms; this may be an explanation of why many people in older age groups who have much osteoarthritis are not bothered by any difficulties except the gradual loss of motion of the neck. Narrowing of the intervertebral disks and hypertrophic changes about the joints seem to go hand in hand. It may be necessary at times to review a series of oblique roentgenograms to demonstrate encroachment on nerve roots in the foramina.

The treatment given in the Section of Physical Medicine and Rehabilitation includes the application of heat either by diathermy or baker for thirty minutes followed by sedative massage to the cervical, upper thoracic and shoulder regions of the involved side as well as the use of cervical traction. By preliminary application of heat and massage, the pain, muscular spasm and muscular tenderness can be modified so that the patient tolerates cervical traction much better. Our method is to apply traction, using a Sayre head sling with traction varying from 30 to 90 pounds, depending on the patient's tolerance and his ability to maintain relaxation of the cervical musculature during traction. The average pull is 60 pounds. While the traction is being applied, patients are instructed to shrug the shoulders and then relax; the physician then assists the patient to rotate the head slowly to the maximal range of motion two or three times. In some instances, the rotation is done entirely by the patient with the physician stabilizing the shoulders of the patient. All patients who are referred to our section for treatment are instructed in the home-treatment routine developed by Krusen.[10] The home treatment recommended consists of the use of a simple heat lamp or baker[11] followed by massage by some member of the family and then finally use of a simple home-treatment head sling (Fig. 1).

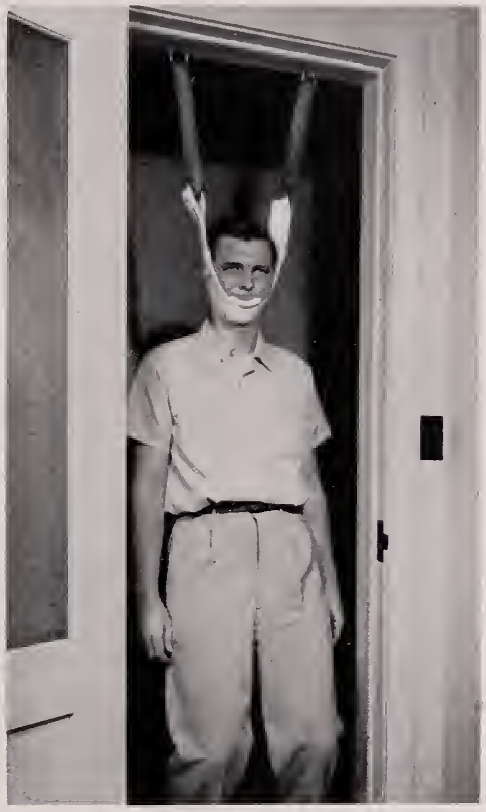


Fig. 1. Method of using home-treatment head sling. Someone should be with patient during this procedure to help him in and out of the sling.

Protruded Cervical Disks

Posterior or lateral bulging of a cervical disk or nucleus pulposus is now recognized as a frequent cause of brachial pain. Semmes and Murphy,[7] in 1943, pointed out that a laterally protruding disk markedly narrows the foramen and exerts pressure on the nerve root. If hypertrophy of the ligamentum flavum coexists, compression of the root will occur earlier. Cervical disks are constructed more delicately and are thinner than those in the lumbar region but they support much less weight. The disk between the sixth and seventh cervical vertebra is the most mobile and, therefore, the most subject to trauma. According to Corbin,[6] this is the disk in the cervical portion of the spinal column which most commonly compresses the nerve root.

Pain is felt medial to the scapula on the affected side, sometimes over the pectoral region, and may extend from the shoulder down the arm into the forearm and, less often, into the hand and fingers. Irritation of the seventh cervical root usually causes parasthesia, less often pain, in one or more of the first three digits on the affected side, whereas compression of the sixth cervical root produces symptoms more commonly in the dorsum of the thumb. Lateral flexion of the hyperextended neck will often precipitate or aggravate the pain, especially if pressure is applied to the top of the head.

Traction on the cervical portion of the spinal column may give prompt relief if a protruded disk is pressing on a cervical nerve. The pain is aggravated by coughing, sneezing or straining and usually is accompanied by splinting of the neck muscles, with tilting of the head away from the side affected. Pressure over the lateral cervical spines or transverse processes may be painful. Objective sensory changes may be detected in the hand corresponding to the paresthetic zone. Weakness of specific muscles is infrequent but may be detected in the biceps or triceps. Similarly, the biceps or triceps reflexes may be diminished or absent. X-ray examination of the cervical portion of the column in the presence of a protruded disk usually will disclose a loss of the normal curve with narrowing of the interspaces. Patients with this condition who are referred to the Section of Physical Medicine and Rehabilitation are given essentially the same treatment as that for cervical osteoarthritis.

It is our impression that intensive vertical traction for short periods is more effective than cervical traction applied with the patient in bed in the supine position.

Whiplash Injuries

Gay and Abbott[12] pointed out how frequent automobile accidents occur as a result of a rear-end collision and that a whiplash injury is the common sequela. Patients who have sustained an injury of the whiplash type from such an accident or from any other cause have the symptoms and findings characteristic of sprain of the neck. These consist of pain, limited motion, and spasm and tenderness of neck muscles. Movement jarring of the neck makes the symptoms worse many of these patients tend to support their h and neck with their hands. In the series repor by Gay and Abbott,[12] 26 per cent of the patie with whiplash injuries had persistent cervi radiculitis with pain and paresthesia extend into one upper extremity or alternating in b extremities, indicating protruded interverteb disk. Other of their patients were described having hypertrophic arthritis of the cervical p tion of the spinal column and some had s luxations of the lower cervical vertebrae. M of the patients who are seen at the Mayo Cl with this condition have had their symptoms weeks or even months, and recently we had a m who had worn a neck brace for three years.

Gay and Abbott[12] pointed out that const wearing of a neck support results in atrophy the cervical muscle and adds the complicat factor of weakened cervical muscles to the patie problem. These patients are benefited by use of a cervical collar in the early stages of t disorder but it seems important to make sure t the patient gradually discontinues its use after neck limbers up.

The program in our department has be essentially the same as that described for treatment of osteoarthritis of the neck or for treatment of cervical disks. Since many of th patients have marked limitation of cervi motion, a much longer period of treatment required in order to bring about improvement the range of motion. Furthermore, since so of these patients have weakness of the cervi muscles, we add strengthening exercises to th program.

Outlet Syndrome

All of the conditions producing the outlet sy drome have a similar pattern of symptoms, name that of compression of the brachial plexus. T variations of terms for this syndrome have ari from the numerous explanations of the und lying pathology. The etiology is confusing becau so many anatomic deviations have been found the structures of the neck. The correction of ea by surgical means has generally brought relief.

Adson's maneuver is helpful in the diagno It is performed as follows: Radial pulses are co pared for difference in volume, since the out syndrome is usually unilateral. The patient w th arm in a dependent position is asked to turn hi face toward the side being examined, to take a eep breath and to hold it, while hyperextendin the neck. The pulse volume on the side being exmined decreases greatly or fades out and usally the patient's symptoms are aggravated. In the majority of cases, according to Eaton,[2] ne of the structural deviations in the neck and hulder usually described for any one of the cditions in the group can be demonstrated. As a sult, treatment of the outlet syndrome has been ved. Also, symptoms have recurred following ration for scalenus anticus syndrome, cervical ri or one of the other syndromes. All of these pients will have pain and paresthesia in the uper extremity. The pain almost never resembles tht produced by compression of a nerve root in tht there is no strain aggravation. The symps of the hyperabduction syndrome are caused b pressure on the vessels and nerve trunks which ps posteriorly to the pectoralis minor and benth the coracoid process when the arm is eleved as during sleep.

When the etiology of these various types of cmpression syndromes of the brachial plexus is csidered, attention must be paid to the details o posture which might play a part in producing smptoms. It has been pointed out by Todd[8] that vh a gradual descent of the shoulders during cldhood and in early adult life, the brachial xus is stretched over the first rib and symptoms my result without any real anatomic variation.

In the Section of Physical Medicine and Rebilitation at the clinic we have formulated a cinite program of treatment for these patients vich consists of heat and massage and corrective ercises for the neck and shoulders. Progressive istance exercises are used to strengthen the ulder elevators and retractors and, in addition, sture training is given.

Summary

A large percentage of the disabilities of the ck, shoulder and upper extremity which are e to irritation or compression of cervical nerve ots or some of the components of the brachial xus are amenable to physical therapy.

Osteoarthritis of the cervical vertebrae with itation of the nerve roots, protruded cervical k or whiplash injury is treated with heat applied locally, sedative massage and traction of the cervical portion of the spinal column by the aid of a Sayre head sling. Heat and sedative massage to neck and shoulder girdles and special exercises to improve posture and to strengthen the shoulder retractors and elevators are helpful in relieving the symptoms of the outlet or brachial plexus syndrome. Patients can be instructed to carry out these procedures at home under the supervision of the physician.

References

1. Jackson, Ruth: The spine. Number 1. The cervical syndrome. In Pease, C. N.: The American Academy of Orthopaedic Surgeons. Instructional Course Lectures. Vol. 10, pp. 65-90. Ann Arbor, Michigan: J. W. Edwards, 1953.
2. Eaton, L. McK.: Pain caused by disease involving the sensory nerve roots (root pain): its characteristics and mechanics of its production. J.A.M.A., 117:1435-1439 (Oct. 25) 1941.
3. Eaton, L. M.: Neurological causes of pain in the upper extremities: with particular reference to syndromes of protruded intervertebral disk in the cervical region and mechanical compression of the brachial plexus. S. Clin. North America, 26:810-33 (Aug.) 1946.
4. Craig, W. McK., and Knepper, P. A.: Cervical rib and scalenus anticus syndrome. Ann. Surg., 105: 556-563 (Apr.) 1937.
5. Ghormley, R. K.: Shoulder and arm pain. In Thomson, James and Blount, W. P.: The American Academy of Orthopaedic Surgeons. Lectures on Regional Orthopaedic Surgery and Fundamental Orthopaedic Problems (No. 2). Pp. 56-57. Ann Arbor, Michigan: J. W. Edwards, 1948.
6. Corbin, K. B.: The anatomic basis for the more common types of mechanical brachial neuritis. In Thomson, James and Blount, W. P.: The American Academy of Orthopaedic Surgeons. Lectures on Regional Orthopaedic Surgery and Fundamental Orthopaedic Problems (No. 2). Pp. 57-67. Ann Arbor, Michigan: J. W. Edwards, 1948.
7. Semmes, R. E., and Murphy, Francis. The syndrome of unilateral rupture of the sixth cervical intervertebral disks with compression of the seventh cervical nerve root: a report of four cases with symptoms simulating coronary disease. J.A.M.A., 121: 1209-1214 (Apr. 10) 1943.
8. Todd, T. W.: Quoted by Wright, I. S.: The neurovascular syndrome produced by hyperabduction of the arms: the immediate changes produced in 150 normal controls, and the effects on some persons of prolonged hyperabduction of the arms, as in sleeping, and in certain occupations. Am. Heart J., 29:1-19 (Jan.) 1945.
9. Parker, H. L., and Adson, A. W.: Compression of the spinal cord and its roots by hypertrophic osteoarthritis: diagnosis and treatment. Surg., Gynec. & Obst., 41:1-14 (July) 1925.
10. Krusen, F. H.: Personal communication to the author.
11. Krusen, F. H.: A simple inexpensive heat lamp. J.A.M.A., 107:780 (Sept.) 1936.
12. Gay, J. R., and Abbott, K. H.: Common whiplash injuries of the neck. J.A.M.A., 152:1698-1704 (Aug. 29) 1953.

Arteriography as an Aid to Diagnosis

EINER W. JOHNSON, JR., M
Rochester, Minne

VISUALIZATION of the arterial tree of an extremity was first carried out many years ago, on an amputated arm and hand. However, it was not until 1923 that visualization of the arterial tree of an extremity of a living person was accomplished. Since that time arteriography has slowly gained favor as a help in delineating the vascular tree of an involved extremity or set of vessels.

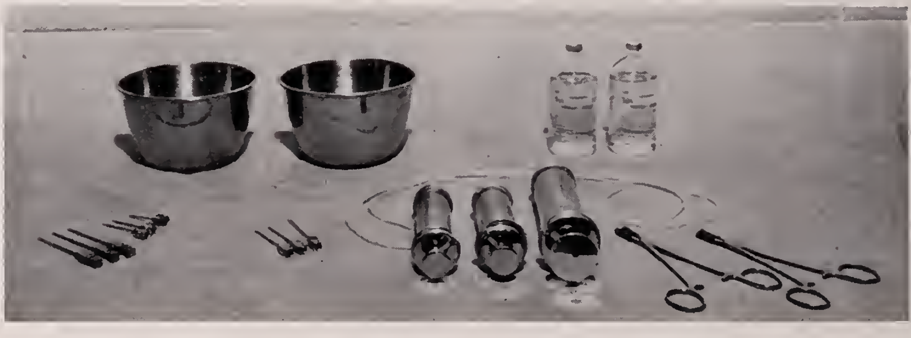


Fig. 1. Materials necessary for percutaneous arteriography.

The basic objectives of making an arteriogram concern demonstration of five aspects of the vascular system. These are: (1) the anatomic aspects, whether they are abnormal or normal, (2) local changes in the vessels, such as occur in arteriosclerosis or thromboangiitis obliterans, (3) occlusion of major vascular trunks, (4) the presence of aneurysms, and (5) the presence of arteriovenous fistulas.

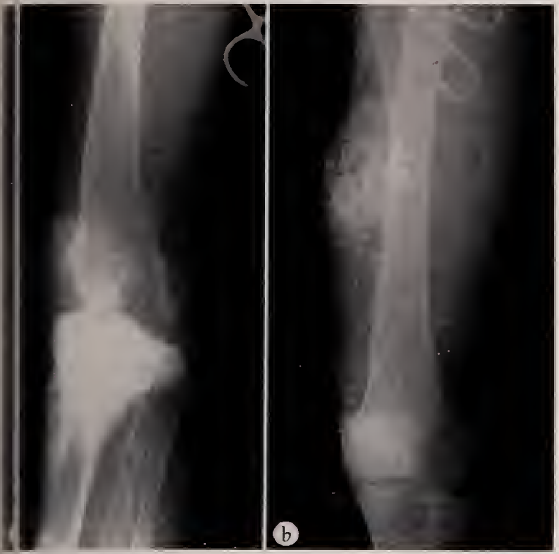
There are two methods of visualizing the vascular tree of an extremity by means of radiopaque material. These are the open injection method and the percutaneous injection method. In the open method the artery is opened down upon, and under direct vision the needle with its accompanying catheter is introduced into the vessel and injection is carried on from that point. In the percutaneous method the vessel is punctured by entering through the skin and the catheter is fed into the artery, the needle subsequently being w
drawn, leaving the catheter in place. Then
injections are carried out as in the open meth

The materials necessary to produce a suita
arteriogram are outlined in Figure 1. The
metal mixing bowls are necessary for dilution
the contrast medium (solution of urokon sodiu
from 70 to 35 or 50 per cent, whichever is r
essary for use in the extremities. We use No.
needles, either 2 or 2½ inches long, complete w
stylets. Catheters of the size of a No. 18 nee
will easily pass through the bore of such need
Syringes of 20 cc. and 50 cc. capacity, cathet
and hemostats used to clamp the catheters also
shown in the figure.

The technique of injection is relatively simp
After the artery has been entered and it is cert
that a free flow of blood back into the cathe
has been obtained, 50 cc. of the solution of urok
is injected. The first 15 to 20 cc. is injected slow
to fill the vascular tree and to perfuse the coll
eral vessels, after which the remainder of the
is injected as rapidly as can possibly be done. T
roentgenogram is made during injection of
last 10 cc. of the solution. The x-ray film is c
tered over the portion of the extremity which i
wished to visualize. If it is desired to visual
more material than can be accommodated wit
the standard x-ray film measuring 14 by
inches, two x-ray plates can be used or t
separate x-ray exposures can be made at d

From the Section of Orthopedic Surgery, Mayo Clinic and Mayo Foundation, Rochester, Minnesota.

The Mayo Foundation is a part of the Graduate School of the University of Minnesota.



ig. 2. (*a*) Paget's disease of the upper part of the
(*b*) Fibrosarcoma of the thigh.

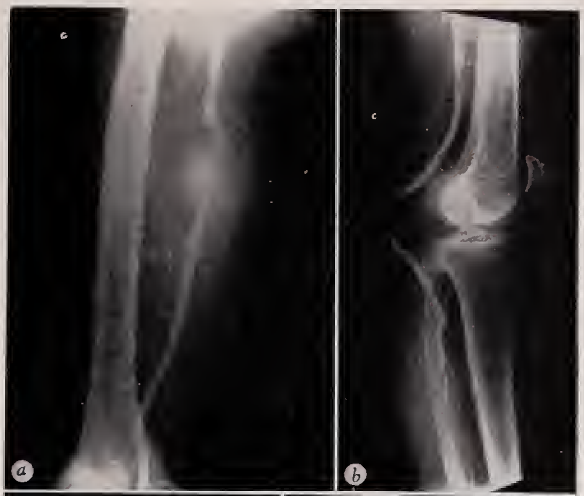
ent levels by the use of two separate injec-
is. The exposure time, so far as the roent-
ogram is concerned, usually is 2½ to 3 sec-
ls, but may vary as to actual need. It is pru-
it to make a check roentgenogram, so that the
nician will have the proper exposure time and
er factors on the machine prior to injection of
dye.

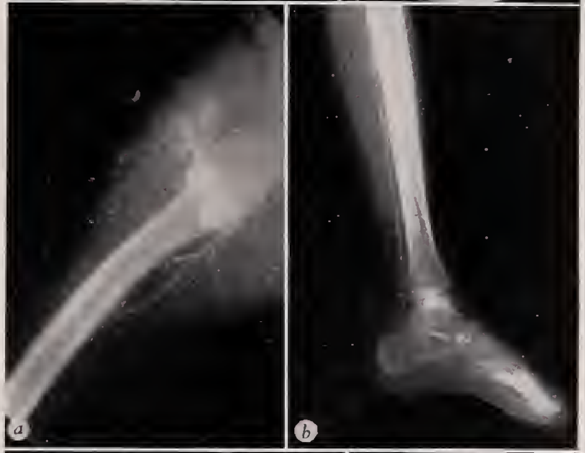
he figures illustrate several cases in which an
riogram has been of help. Figure 2*a* is an
riogram made for a man who had a pulsation
the upper part of the left tibia. It was sus-
ted that he had Paget's disease. The arterio-
m revealed that a considerable amount of the
had lodged in the upper part of the tibia.
arteriogram thus indicated that the man prob-
had many minute arteriovenous fistulas.

igure 2*b* shows a mass in the mid-part of the
h. This mass subsequently proved to be a
osarcoma of the thigh. The arteriogram dem-
rates considerable abnormal vascular channels,
nding which is helpful in arrival at the diag-
s of a malignant tumor.

igure 3*a* is an arteriogram of a pulsating mass
the mid-portion of the femoral area. The
riogram demonstrates an aneurysm of the right
erficial femoral artery.

igure 3*b* is an arteriogram of a pulsating mass
he popliteal space. This mass was thought to
popliteal aneurysm. The arteriogram, which
made to delineate the aneurysm and to sustain or disprove the diagnosis, revealed that the lesion was not an aneurysm at all, but rather, a





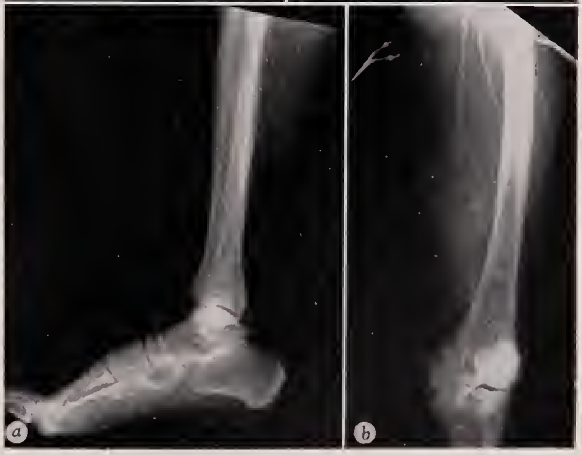


Fig. 3. (top) (*a*) Aneurysm of the superficial femoral artery. (*b*) Popliteal synovial cyst.

Fig. 4. (center) (*a*) Cavernous hemangioma of the upper part of the thigh. (*b*) Occlusion of the dorsalis pedis artery.

Fig. 5. (bottom) (*a*) Occlusion of the posterior tibial artery. (*b*) Segmental occlusion of the superficial femoral artery.

tumor near the posterior surface of the knee joint which had displaced the popliteal artery posteriorly. Surgical exploration proved this lesion to be a synovial cyst or ganglion cyst of the popliteal space.

Figure 4*a* is an angiogram of a palpable mass in the upper part of the thigh. This lesion at palpation imparted the sensation of a water-filled sponge. The angiogram showed it to be a cavernous hemangioma.

Figure 4*b* depicts an unhealed ulcer on the dorsum of the foot. The patient was a diabetic woman, and the roentgenogram shows that previously she had lost all her toes. The unhealed ulcer considerably complicated the management of the diabetes, and an arteriogram was made to visualize the vascular tree of this extremity. Note that the arteriogram has revealed occlusion of the dorsalis pedis artery.

Figure 5*a* shows the foot of a man who had n unhealed ulcer beneath the external malleolus d considerable ischemia of the foot. An arteriog was made to visualize the vascular tree of this volved extremity. It revealed a diseased su ficial femoral artery and an occluded poste r tibial vessel.

Figure 5*b* is an arteriogram of the thigh man who had intermittent claudication and in the calf and thigh, ascending into the buttc after he walked more than a half-block. Arter raphy of this involved extremity disclosed segn tal occlusion of the superficial femoral artery.

In conclusion, it is believed that these exan s demonstrate the value of an arteriogram as n aid to diagnosis, as a distinguishing techniqu n diagnosis and as a means of delineating vasc r disease.

FUNCTION OF ENDOCRINE ORGANS

(Continued from Page 372)

with slow cerebration, dehydration and potassium deficiency; the acid-base balance is disturbed, the blood volume reduced, et cetera, but generally no other circulatory disorders are observed.

The question arises whether adrenocortical hypofunction develops in such a condition. This question is difficult to answer. We have in no instance seen hormonal and physiopathological disturbances suggesting insufficiency, and especially in no case of protracted rise in the adrenocortical function observed the development of hypofunction. On the other hand, there may be a relative or partial adrenocortical insufficiency in such cases.

Observations which we made in five cases with severe, postoperative circulatory insufficiency, with a fall in blood pressure to 60 to 50 mm. Hg, treated with 17-hydrocorticosterone (400 to 500 mg. per twenty-four hours intravenously), seem to support the supposition of the possibilit of partial or relative adrenocortical insufficiency

It was impossible in these cases to obtain n essential rise in blood pressure with blood tr sfusions. In all five cases the administratior of 17-hydrocorticosterone caused a fall in pulse e and a rise in blood pressure to over 100 mm. g. In addition there was a material improven nt in the general health, both psychically d somatically. However, it was managed onl take one of the four patients over the crisis.

Figure 17 shows the course in one patient. e blood pressure and the pulse variations are sh n in relation to the administration of blood d 17-hydrocorticosterone (preparation hydro rtone), respectively.

Finally, I should like to emphasize that the st prophylaxis of securing satisfactory operative esults is a thorough preoperative treatment d good surgery.

Mnnesota Maternal Mortality Study for 1953

I this report, all of the known maternal deaths ccurring from April 1, 1953, through March 1 954, have been evaluated, and these data will e illed "The 1953 Survey." Previously published o mittee reports for the years 1941-1942, 1950, 9 , and 1952 will be used for comparisons. The e ils of methods and criteria of the study have e published. All known deaths occurring dur- pregnancy or within three months after termi- a n of pregnancy are included for the study. hs due to chorioepithelioma are included in tudy for the year in which they occur.

A E I. MATERNAL DEATHS IN MINNESOTA T IES FOR 1941, 1950, 1951, 1952 AND 1953

e	Number Deaths	Number Births	Gross Mortality Rate per 1,000 Live Births†	Maternal Mortality Rate per 1,000 Live Births‡	U.S. Maternal Mortality Rate per 1,000 Live Births
4	112	55,293	2.03	1.68	2.8 *
5	68	76,074	0.89	0.59	0.83
5	57	80,099	0.71	0.45	0.75
5	58	78,990	0.73	0.42	0.68
9	59	79,362	0.74	0.42	0.62**

* rage for 1941 and 1942

* fficial

† luding all maternal deaths from whatever cause.

‡ luding deaths considered as non-obstetrical on the basis of the nitions set down by the United States Bureau of the Census, using the information obtained from detailed study of each case. s latter adds to the number of so-called "obstetric" deaths some which would be considered "non-obstetric" on basis of death ificate information alone.

s previously emphasized, the usual method of g death certificate data exclusively for com- ion of statistics on maternal deaths is inac- te and inadequate. All of the deaths in preg- or parturient women are used to calculate the s maternal mortality rate for the state, and the ected number, listing only the "obstetrical hs," is used for the Minnesota Maternal Mor- y rate. These rates for the years of the study ar in Table I. The 1953 figure compares rably with those of recent years and reflects inued excellence of obstetric care afforded by nesota physicians. Most of the results for 1953 as presented in the subsequent tables are essentially the same as that for 1952. The differences as noted in comparing the 1953 figures with the 1950-1952 averages are due to higher rates for the first two of those years.

TABLE II. SOURCE OF REPORT OF MATERNAL DEATHS

	1950-52		1953	
	Number	Per Cent	Number	Per Cent
Cases found from death certificate (with or without prelim. reports from physicians, hospitals, etc.)	135	73.8	43	72.9
Sources other than death certificate	48	26.2	16	27.1
Cross match of death with birth certificates— 11=18.6% Others 5= 8.5%				

Table II shows the sources of reports of maternal deaths. About the same per cent of additional cases was found this year by means other than standard reporting. Cross matching death certificates with birth certificates turned up eleven additional cases, and other sources such as reports from hospitals and physicians brought five more to our attention, for a total of 27 per cent of the cases. In this group of sixteen, two patients died postpartum of rheumatic heart disease, two depressed patients committed suicide, and one died of pulmonary embolism on the eighteenth day after delivery. This serves to emphasize the type of case which would be missed using death certificate information only. The others in this group died of "non-obstetrical" causes. To make the study all inclusive, the State Department of Health requires a report within three days of death of all patients dying during pregnancy or in the three months postpartum period. These should be reported regardless of whether or not the death was thought to be "obstetrical." Because of failure to comply with this requirement, there are probably some cases which are still being missed for study when death occurs before delivery or in pregnancies delivered before the twentieth week when a birth certificate is not required.

---

fth annual report of the Minnesota Maternal tality Study Committee, subcommittee of the rnal Health Committee of the Minnesota State ical Association.

TABLE III. ANALYSIS OF DEATH CERTIFICATES

	1950-52		1953	
	Number	Per Cent	Number	Per Cent
Death certificates complete and correct in all details	57	31	22	38
Death certificates correct in all details reported	54	30	16	27
Death certificates incorrect	72	39	21	35
Death certificates incorrect as to cause of death	(52=28%)		(14=23.8%)	
Total maternal deaths	183	100.0	59	100.0

Inaccuracies of Death Certificates

The data for maternal mortality reports are generally based on death certificate report only. The inadequacy of this is pointed out above. The inaccuracy of this has been previously reported and is again evident as shown in Table III. In the 1953 study only 38 per cent of the death certificates were complete and correct in all details. Thirty-five per cent were incorrect in some detail. Twenty-seven per cent were incomplete. In 23.8 per cent the cause of death was incorrect. This represents a considerable error which can be detected only by individual study of each case. The reasons for the errors are much the same as in the past. In three cases a positive cause of death was reported when actually the cause was unknown and should have been reported as such. One patient whose death was reported as being due to "premature separation of the placenta and Rh factor" died six hours after delivery of inadequately treated postpartum hemorrhage. One whose death was attributed to acute toxemia died from the administration of Rh incompatible blood. Another patient who died of puerperal infection was signed out as dying from massive pulmonary edema. These suffice to demonstrate again the major inaccuracies. A multiplicity of errors in reporting, or failure to report minor details as required on the death certificates reflects carelessness in the filling out and signing of these documents.

Results of the 1953 Survey

The number of preventable maternal deaths in 1953 was 15 or 25.4 per cent of the total. This is more than the 17.2 per cent reported in 1952 but compares favorably with the 30.6 per cent average for the 1950-1952 period (Table IV). This certainly reflects a considerable improvement over the 73.2 per cent of preventable deaths as reported in the 1941 study. The total number of "obstet" deaths is the same as for last year but percenta-wise shows improvement over the averages of e previous years (Table V).

TABLE IV. PREVENTABILITY OF MATERNAL DEATHS IN MINNESOTA

	1941		1950-52		1953	
	Number	Per Cent	Number	Per Cent	Number	C
Preventable	82	73.2	56	30.6	15	2
Not preventable	27	24.1	124	67.8	44	7
Not determinable	3	2.7	3	1.6	0	

TABLE V. OBSTETRIC AND NON-OBSTETRIC DEATHS

	1941		1950-52		1953	
	Number	Per Cent	Number	Per Cent	Number	P C
Obstetric deaths	93	83.0	118	64.5	33	5
Non-Obstetric deaths	19	17.0	65	35.5	26	4

TABLE VI. TYPE OF DELIVERY

	1950-52		1953	
	Number	Per Cent	Number	Per t
Undelivered	65*	35.5	19**	32
Spontaneous	53	29.0	16	27
Operative	67	35.5	24	40
Indicated	43		21	
Not indicated	24		3	

*Includes 7 delivered by postmortem section.
**Includes 3 delivered by postmortem section.

Table VI shows the number of operative -liveries for this year. There were twenty-fou s compared with twenty in 1952. Those in wh h the operation was not indicated remain the s e at three (12.5 per cent). Improvement in s direction is evident when one compares this t a total of 36 per cent unindicated operations in e 1950-1952 combined series. Three post-mor n sections were done and in all of these the fet s were stillborn. This brings to a total of fifteen e post-mortem sections appearing in this study n the past four years, and in none was a live f s produced. Another patient reported as havin a post-mortem section in the 1953 study was act l-ly sectioned in the agonal state following a cere l vascular accident. This fetus survived for thi -

T LE VII. SEROLOGIC TEST FOR SYPHILIS

	1941		1950-52		1953	
	Number	Per Cent	Number	Per Cent	Number	Per Cent
r stered	18		31		11	
o ined	64	68.1	83	54.6	21	43.8
ned	30	31.9	69	45.4	27	56.2

TABLE IX. CONSULTATIONS

	1941		1950-52		1953	
	Number	Per Cent	Number	Per Cent	Number	Per Cent
N	63	56.2	79	43.1	19	32.2
icated			39		6	
licated			40		13	
quate	10	9.0	69	37.7	33	56.0
equate	39	34.8	35	19.2	7	11.8
T ls	112	100.0	183	100.0	59	100.0

si hours. Eight patients who died were delivered b cesarean section. Only one cesarean section ws considered as not being indicated. The other u ndicated operative deliveries were as follows: i one, the patient was delivered by version and e raction and died of hemorrhage due to uterine r pture; another was delivered by accouchement f cé followed by version and extraction. This p ient, who had a placenta previa, died of hemorr age and shock. This unindicated procedure cont ues to contribute to avoidable maternal mortali despite the hope that it was a thing of the past v en none were reported in the 1952 study.

Table VII shows the number of patients who d serologic tests for syphilis during early preg ncy. This figure of 56.2 per cent is another ich is essentially the same as for 1952 but it lects improvement over the averages for the 50 to 1952 series. A similar circumstance is wn in the use of Rh tests early in pregnancy able VIII). Here the per cent obtained early i pregnancy is about the same for 1952 but again ead of the three-year average.

The trend toward more frequent use of better nsultants is shown in Table IX. Inadequacies rsist due to failure to use the better trained men some communities as consultants and in asking consultation too late for it to be of value. ere were six cases in which consultation was indicated, consultants being available but not used. In four of these the death was considered preventable, and adequate consultation would have been most helpful in trying to change the course of events.

TABLE VIII. RH DETERMINATION

	1950-52		1953	
	Number	Per Cent Registered Patients	Number	Per Cent Registered Patients
Unregistered	31		11	
Not obtained (Registered patients)	48	31.6	10	20.8
Obtained at hospital	30	19.6	8	16.6
Obtained early in pregnancy	73	48.1	29	60.5
No data	1	0.7	1	2.1
Totals	183	100.0	59	100.0

TABLE X. PELVIC MEASUREMENTS

	1941		1950-52		1953	
	Number	Per Cent Registered Patients	Number	Per Cent Registered Patients	Number	Per Cent Registered Patients
Unregistered	18		31		11	
Not measured or incompletely measured	77	81.9	97	63.8	27	56.3
Measured	17	18.1	55	36.2	21	43.7

The figures presented in Table X still show considerable neglect of pelvic mensuration in the cases studied. Some of this related to failure to recheck pelvimetry in multiparous patients who present themselves for prenatal care for the first time in the given office. In other cases the measurements were said to have been done but not recorded. The measurement of the diagonal conjugate, transverse diameter of the outlet, and the palpation of the ischial spines and sacrum require a minimum of effort and should be recorded in all cases. These measurements, with the palpation of the internal pelvic contours, are sufficient to pick up the candidates for x-ray pelvimetry. Despite lack of pelvic mensuration there were no deaths in the 1953 study due to cephalo-pelvic disproportion.

The adequacy of prenatal care is summarized in Table XI. Only 16.7 per cent of the patients in the 1953 study had adequate prenatal care as

TABLE XI. PRENATAL CARE

	1941		1950-52		1953	
	Number	Per Cent	Number	Per Cent	Number	Per Cent
Adequate	2	1.9	31	20.2	8	16.7
Faulty, contributory	55	52.9	29	19.0	5	10.3
Faulty, not contributory	47	45.2	93	60.8	35	73.0
None	8		30		11	
Totals	112	100.0	183	100.0	59	100.0

TABLE XII. CARE IN LABOR AND DELIVERY

	1941		1950-52		1953	
	Number	Per Cent	Number	Per Cent	Number	Per Cent
Adequate	7	7.8	55	38.7	18	44.0
Faulty, contributory	61	67.8	53	37.3	10	24.4
Faulty, not contributory	22	24.4	34	24.0	13	31.6
None	22		41		18	
Totals	112	100.0	183	100.0	59	100.0

compared to 21.3 per cent in 1952. The present figure is also lower than that of the three-year average as shown in the table. The number of patients having faulty prenatal care contributing to the patient's death was the same in each of the last two years. With respect to care in labor and delivery, the 1953 study compares favorably with the 1950-1952 average but the 24.4 per cent who had faulty delivery care contributory to the patient's death suffers by comparison with the 8.9 per cent reported in 1952. The figures for post-partum care show a trend toward improvement.

The frequency with which adequate autopsies were obtained has increased. 49.2 per cent is an excellent level in any group of patients, but can be improved (Table XIV). Thirty-four per cent failure to request autopsies is much too high. Among the reasons given for this is the lack of an available pathologist. Arrangements can be made for a pathologist to do these autopsies if the State Department of Health is notified of the death. Autopsy is certainly indicated in the cases in which the cause of death is unknown. There are others in the study in which the cause of death was probable but not proven, so that here too the usefulness of adequate autopsy is apparent.

TABLE XIII. POST PARTUM CARE

	1941		1950-52		1953	
	Number	Per Cent	Number	Per Number	Number	P Ce
Adequate	4	4.8	48	43.6	21	58
Faulty, contributory	67	79.8	51	46.4	9	2
Faulty, not contributory	13	15.5	11	10.0	6	16
None	28		73		23	
Totals	112	100.1	183	100.0	59	100

TABLE XIV. AUTOPSIES

	1941		1950-52		1953	
	Number	Per Cent	Number	Per Cent	Number	P Ce
Obtained, adequate	9	8.0	71	38.8	29	49
Obtained, inadequate	27	24.1	6	3.3	1	1
Not requested	55	49.1	70	38.3	20	34
Permission refused	21	18.8	36	19.6	9	15
Totals	112	100.0	183	100.0	59	100

TABLE XV. PRIMARY CAUSES OF MATERNAL DEATHS IN MINNESOTA, 1953 STUDY

Cause of Death		Number	Per Ce
Toxemia		8	13
Hemorrhage		4	6
Transfusion accidents		4	6
Heart disease		4	6
Infection		4	6
Suicide		2	3
Pulmonary embolism		2	3
Amniotic fluid embolism		1	1
Pituitrin shock		1	1
Acute pulmonary edema		1	1
Anesthesia (hexylcaine HC1)		1	1
Diabetic acidosis		1	1
Non-obstetrical complications		26	44
Bulbar poliomyelitis	6		
Intracranial hemorrhage	4		
Neoplasms	4		
Peritonitis	3		
Trauma	4		
Unknown	3		
Meningitis	1		
Lupus erythematosus	1		
Totals		59	100

Causes of Death

The causes of death in the 1953 study a listed in Table XV. There were thirty-three “o stetrical” deaths, which compares favorably wi the thirty-three “obstetrical” deaths in the 19 study. Toxemia accounts for the largest numb of deaths as it did in 1950. In 1951 and 19 deaths due to hemorrhage headed the list. Two these eight patients had not registered for p nal care. One had a fulminating pre-eclampsia un arrival at her local hospital and convulsed or and three-fourths hours later. She had signs of a cerebral vascular accident and remained atose until death. The other unregistered pa- it had a severe arteriolosclerotic toxemia. She w hospitalized immediately after her first office at the thirty-sixth week, at which time she no symptoms. Soon thereafter she had a con- ion, following which she remained comatose u il death two hours later.

nother patient at the twenty-ninth week of ation developed pre-eclampsia which was well c trolled during nine days of hospitalization. At t end of that time she developed a fulminating p -eclampsia which was treated medically. A c vulsion occurred five hours after this change a l she remained comatose until death. There w failure here to interrupt the pregnancy with t onset of the fulminating pre-eclampsia. An- er patient developed eclampsia at home the t enty-eighth week of pregnancy. She responded ll to medical management after hospitalization. o days later she had increasing symptoms of t emia for a time, was better the next day, and ldenly worsened and died on the fourth day er the onset of eclampsia. This pregnancy uld have been interrupted during the time en the eclampsia was under control. Two pa- nts with arteriolosclerotic toxemia developed latio placentae. One of these had renal failure ior to the onset of the symptoms of placental aration, was treated by hysterotomy, and re- ined anuric until death eight days later. The ier had the findings of placental separation, was ated by cesarean section and was there- ter anuric until death. There was no data re- rding renal output prior to the operation.

The seventh patient in this group had a long story of pre-eclampsia. She was admitted to e hospital at term in anticipation of interruption the pregnancy by induction or section. During at night she developed signs of fulminating pre- lampsia which were overlooked for several hours. hen, during the convulsive phase, she was de- ered by cesarean section. The convulsions con- nued at frequent intervals until her death. Here opportunity at earlier interruption was missed. was unwisely undertaken before the convulsions ere under control. The last of these patients ad her initial convulsion while she was bathing a tub. The eclampsia was satisfactorily managed but she died of pneumonia due to the aspiration of the soapy water. Three of these eight were considered to be preventable deaths.

Of the patients who died of hemorrhage, one was seen by a physician at home early in labor. He failed to diagnose either the pregnancy or labor. He was called to see her again three days later, at which time she was found to be dead. Delivery occurred some hours before but the placenta was still in place. The most likely cause of death was shock due to hemorrhage associated with retained placenta. Another patient had intrapartum bleeding of minor amount and of undiagnosed origin. She died about six hours after delivery from hemorrhage due to untreated postpartum uterine atony and delayed, inadequate blood replacement. A third in this group was delivered by an unindicated version and extraction, done twelve hours after membrane rupture. She suffered a uterine rupture and promptly died of untreated blood loss. The fourth had a placenta previa. She was delivered by accouchement forcé with lacerations of the birth canal. After this she continued to bleed profusely and remained in shock until death. Aside from the faulty delivery procedure she had inadequate and delayed blood replacement. All of these hemorrhage deaths were considered preventable.

A reduction in the total number of deaths due to hemorrhage is not without its price, as shown by the occurrence of four transfusion accidents in the present year's study. The value of adequate blood replacement is without question. However, the dangers associated with the administration of blood should be re-emphasized. In one instance a patient was receiving a blood transfusion following an abortion. The flow of blood was rather slow and air pressure was applied to the blood. No one was present when the last of the blood ran in. When a nurse returned to the room, the patient was unconscious, cyanotic, having gurgling respirations and convulsing. Efforts at resuscitation failed. This death was due to massive air embolism. Another patient with placenta previa whose blood type was O, Rh positive was given 500 cc. of AB, Rh positive blood. She promptly developed oliguria and eventually died of uremia. She had very high anti-A, anti-B blood titers prior to her death.

Laboratory error in another case resulted in a sensitized Rh negative patient getting Rh positive blood. She developed shock after getting 600 cc.

of Rh positive blood, and in the treatment of the shock she got a total of 2,400 cc. of incompatible blood. Laboratory findings indicated rapid hemolysis of all of the blood administered in that no Rh positive cells could be found in blood sent to a blood bank after the transfusions. This patient expired in a matter of hours. The fourth transfusion accident occurred in a patient with hypertensive toxemia who was delivered by cesarean section. Her blood loss was treated by 1,000 cc. blood replacement plus 250 cc. of 5 per cent glucose in normal saline in a little less than one hour. About one hour later she developed acute left heart failure thought to be precipitated by the rapid blood administration. This occurred in a patient whose heart load was already increased by her hypertension. Three of the transfusion accident deaths were considered preventable.

Two suicide deaths in the puerperium were considered as "obstetric." These patients followed a similar behavior pattern showing agitation and anxiety expressed as a strong feeling of inadequacy in caring for the baby. They were regarded as normal prior to the puerperium, and the seriousness of their depression was not recognized despite unusual expressions of concern over the baby's care, both to family and physicians.

The infection deaths are accounted for by two infected criminal abortions, an undiagnosed appendicitis with rupture, and one puerperal infection. The patient with puerperal infection was hospitalized at thirty-four weeks of gestation with a small amount of vaginal bleeding and ruptured membranes. Nothing further developed at that time, and she was discharged from the hospital and not seen for ten days. At that time she was re-admitted in shock due to blood loss and was ready for delivery. Despite blood administration, which corrected the immediate shock picture, and antibiotic therapy, she followed a down-hill course and died of septicemia with peritonitis and pulmonary edema. The infection had its onset prior to the admission for delivery. The patient with appendicitis was treated for what was thought to be a threatened abortion. Neither examination nor laboratory studies were done to establish this as the cause of her pain or to rule out other causes of an acute abdomen. The diagnosis of appendicitis was not entertained until autopsy.

There were no deaths from inhalation or spinal anesthesia. However, one patient developed shock, convulsed and died after the use of one of the new local anesthetic agents. One patient was giv an ampule of obstetrical pituitrin into the uter and one ampule of pituitrin intravenously at tl time of a cesarean section, whereupon she di immediately. This was a pituitrin shock und anesthesia. Obstetrical pitocin in smaller quan ties would have been the drug of choice.

The "non-obstetrical" causes of death requi little elucidation. Of those due to peritonitis, tv were due to postoperative complications aft cholecystectomy. The third in this group had pe tonitis secondary to perforation of a carcinoma the recto-sigmoid.

Summary and Conclusions

1. A brief general summary of the results the Minnesota Maternal Mortality Study for tl period from April 1, 1953, through March 3 1954, has been presented. Certain compariso are made between these results and those of fo previous studies.

2. There were fifty-nine deaths associated wi pregnancy or in the postpartum period in th 1953-1954 period among 79,362 live births, for a over-all maternal mortality rate of 0.74 per 100 live births. When deaths due to "non-obstetrical complications are excluded the rate is 0.42 pe 1000 live births. These rates are essentially th same as for the previous two years.

3. There was an increase in the percentage deaths considered preventable to 25.4 per cent compared to 17.2 per cent last year. Howeve this is better than the 1950-1952 average of 30. per cent, and well ahead of the 1941-1942 figur of 73.2 per cent preventable deaths.

4. The percentage of deaths associated wit pregnancy but due to "non-obstetrical" causes con tinues to increase. There were 44.1 per cent non obstetrical deaths in this series as compared t 35.5 per cent for the 1950-1952 average an 17.0 per cent in the 1941-1942 study. This due to a reduction in the "obstetrical" death rather than to any increase in the total numbe of cases.

5. Approximately the same proportion of de livered patients who died in 1953 were delivere by operative means as in the previous three years Three, or 12.5 per cent of the operative deliverie were considered as not being indicated.

6. The previously reported inaccuracies and ir

(Continued on Page 431)

Rdioiodine Uptake in the Diagnosis o Thyroiditis

ELMER C. PAULSON, M.D.
Saint Paul, Minnesota

HE classical presenting symptom of thyroiditis is thyroid tenderness. When this is p ent, there is seldom doubt that the patient h the disease. However, it is easy to overlook finding if the patient does not mention it; and b use of the other symptoms, the case may be m aken for a diffuse hyperplastic goiter. Since advent of the thyroid uptake test with radio- ne, clinicians have learned the value of this te in making the differentiation. The purpose of t report is to show how the test has been helpf in this respect.

hyroiditis is not a common disease, and no one is fforded the opportunity of observing a great n nber of cases. The pathological concept g erally falls into three categories: (1) the sub- a te form, (2) the lymphocytic type (Hashimoto's s ma or struma lymphomotosa), and (3) the fi ous type (Riedel's struma or struma fibrosa). these three, the subacute type is the most f quent and, consequently, most important.

Thyroiditis is most prevalent in women. It runs a hronic course over many months. The thyroid ymmetrically enlarged and of firm consistency, a d it is tender. Hoarseness, dysphagia, and c oking are commonly mentioned. In addition, t re are generalized symptoms of anxiety, palpi- t ion, nervousness, fatigue, and weight loss. There i usually more or less tachycardia. The basal tabolic rate is often elevated, which is to be e ected in a nervous, anxious individual, al- t ough this has also been explained on the basis destruction of glandular acini with release of t contained hormone into the circulation.[2] Since t se symptoms and signs are so similar to those of ave's disease, it happens not infrequently that a roid gland, removed under the impression that is toxic, is reported by the pathologist as thy- ditis. In fact, until recent years, the diagnosis s seldom made preoperatively.

During the past eighteen months the opportunity was presented of studying ten cases of thyroiditis by the I^{131} uptake method (Table I). Two of these had been followed for several months clinically as classic cases of thyroiditis. Pathological confirmation was obtained in three of the remaining eight, the others not being subjected to any surgical procedure. The normal range of I^{131} uptake by the thyroid gland in twenty-four hours is considered to be 15 to 45 per cent in our laboratory. In two of the cases (Case 3 and Case 4), the uptake was in the lower portion of the normal range, and in the other eight it was subnormal, in five being very low—consistent with myxedema. It is noteworthy that the two cases which fell in the normal range were both found on pathological examination to be Hashimoto's struma. This is in agreement with the observations of others. (See below). In general, the I^{131} uptake test does not have the diagnostic value in distinguishing Hashimoto's struma that it does in subacute thyroiditis since the uptake may range all the way from subnormal to high. The test was particularly helpful in Case 3, which was being considered clinically as a recurrent thyrotoxicosis. Of special interest also was Case 7. This patient had been tested eleven months previously because of an adenoma in the left lobe and found to have an uptake of 28 per cent. In contrast, her uptake was only 10.8 per cent shortly after the onset of thyroiditis.

In 1950, Hamilton, Kirkendall, and Barker[2] reported the uptake of I^{131} and the plasma protein bound iodine in four cases of subacute thyroiditis. They found the I^{131} uptake to be very low, and the PBI to be at high normal or elevated levels at an early stage in the disease, but both of these approached normal later in the course of the disease.

Tschumay, Beierwaltes, and Lampe[1] make the same statement, with a distinction between behavior of the I^{131} uptake early and late in the disease.

Furr and Crile[3] collected a series of sixty-two cases of struma lymphomotosa over a twelve-year

---

Dr. Paulson is Clinical Assistant Professor, Radiology adioisotopes), University of Minnesota.

TABLE I.

Case No.	Patient	Sex	Age	I-131 Uptake	Clinical Data	Duration	Pathology
1	L.A.	F	35	5-25-54 2.4%	Fatigue, irritability; feels cold; Soreness on swallowing. 10 lb. weight loss. Thyroid enlarged three times normal, tender. Pulse 98.	6-8 wks.	Thyroidectomy 6-24-54 Path: Chronic exudativ thyroiditis.
2	H.B.	F	42	8-13-54 14.%	Had thyroidectomy in 1936. Now nervous, tremorous, weak, losing weight. Pulse, 84. Thyroid tender, nodular, slightly enlarged.	not known	
3	A.K.	F	58	1-15-54 16.9% 4-23-54 20.4%	Thyroidectomy in 1933. Palpitation, anxiety, nervousness, tightness in neck. No thyroid tenderness. Thyroid enlarged four times normal, firm. Pulse, 80.	4 mos.	Needle biopsy 5-6-54 Path: Hashimoto's stru
4	B.L.	F	44	8-9-54 22.5%	Goiter for many years, enlarging for past year. Dysphagia. Thyroid four times normal, tender. Pulse, 62.	1 mo.	Thyroidectomy Path: Hashimoto's stru
5	C.L.	F	25	8-4-54 4.%.	Thyroid slightly enlarged and tender for seven months. Followed clinically as thyroiditis.	7 mos.	
6	H.S.	F	40	7-15-54 14.%	Followed clinically as thyroiditis. Thyroid tender, nodular and enlarged.	8 mos.	
7	D.W.	F	75	3-18-55 10.8%	Fatigue, dysphagia. Recent enlargement of adenoma of left lobe, probably due to hemorrhage. Pulse, 82. Eleven months earlier, I-131 uptake was 28%, when none of above symptoms were present.	2 wks.	
8	C.T.	F	34	9-14-55 0.5%	Tired, nervous; hair dry. Thyroid enlarged two times, tender, firm. Pulse, 100.	3 mos.	
9	J.Z.	F	40	11-2-55 1.2%	Anxiety, irritability, slight hoarseness and dysphagia. Thyroid enlarged, nodular, firm, tender. Pulse, 96.	4 wks.	
10	R.S.	F	40	7-13-55 1.3%	Thyroidectomy twenty years ago. Pain in neck. Dysphagia, hoarseness. Enlarged, firm, tender left lobe of thyroid. Pulse, 100.	1 mo.	

period at the Cleveland Clinic. Seventeen of these had I^{131} uptakes, all of which were normal.

Recently Skillern, Crile, et al[4] published another study of thirty-six cases of Hashimoto's struma in which they pointed out the wide range of the I^{131} uptake in this disease and concluded that it is not a good measure of thyroid deficiency in this syndrome.

Dr. Joseph M. Ryan,[5] of Saint Paul, has tested with I^{131} two cases of Hashimoto's struma, one with an uptake of 41 per cent which was confirmed surgically, and the other with a 56 per cent uptake being a clinical diagnosis.

Evans[6] followed two cases of thyroiditis with serial uptakes, one for eight months and the other for sixteen months. The initial uptakes in the first weeks of the disease were under 5 per cent, but these rose to normal levels within two to three months, following satisfactory clinical response to radiation therapy.

In our series of ten cases there is no evident relationship between the uptake and the duration of the disease, although serial uptakes were not done. The only conclusion warranted in this respect is that the low uptake reflects a poorly-functioning, diseased thyroid. With subsidence of the inflammation and return to normal function, whether this occurs in a few months or requires a year or more, the uptake can be expected to rise to the normal range again.

Although it is not intended here to discuss treatment of thyroiditis, the low I^{131} uptake suggests the rationality of administering whole thyroid extract during the course of the disea Surgery does not seem to be indicated unl malignancy is suspected. Needle biopsy shou be very useful in mitigating such suspicion. T extensive lymphocytic infiltration of Hashimot struma validates the rationale of such lymphocy lytic agents as radiation therapy and cortisone.

Summary

The thyroid uptake test with I^{131} is useful substantiating the diagnosis of subacute thyroidi since the avidity of the gland for iodine is c pressed during the duration of this disease. Ho ever, in Hashimoto's struma the I^{131} uptake variable. The test is also a useful guide in tre ment since it indicates when supplemental wh thyroid should be given, along with other measur

References

1. Tshumy, W. O.; Beierwaltes, W. H., and Lampe, Thyroiditis—its diagnosis and treatment. Ur Michigan. M. Bull., 19:245-254 (Sept.) 1953.
2. Hamilton, H. E.: Kirkendall. W. M., and Bark S. B.: Radioiodine uptake of thyroid and plas protein bound iodine in subacute thyroiditis. Clin. Invest., 29:819 (June) 1950.
3. Furr, Walter, Jr., and Crile, George, Jr.: Stru lymphomotosa: clinical manifestations and respo to therapy. J. Clin. Endocrinol., 14:79-86 (Ja 1954.
4. Skillern, P. G.; Crile, George, Jr.; McCullou E. P.; Hazard, J. B.; Lewis, L. A., and Brown, Struma lymphomatosa: Primary thyroid failure w compensatory thyroid enlargement. J. C Endocrinol., 16:35-54 (Jan.) 1956.
5. Ryan, Joseph M.: Personal communication.
6. Evan, Titus C.: Radioactive iodine in thyroid orders. J. Iowa M. Soc. (April) 1955

Now Available

7 Years Sickness Benefits

(HOUSE CONFINEMENT NOT REQUIRED)

Lifetime Accident Benefits

This extension of benefits is now available to you as a member of the Minnesota State Medical Association. Since December, *1947,* the inception date of our plan for members of your Association, the Caswell-Ross Agency has attempted at all times to secure for you the finest coverage in the accident and sickness field. These improvements will make your policy the best among many available to you. An application has been sent to you previously—why not complete and return it to our office now.

CASWELL-ROSS AGENCY

1177 N. W. Bank Building
Minneapolis 2, Minnesota
Minneapolis—FE 2-2585
St. Paul—MI. 5-7004

Administrators of Professional Disability Plans

- Minnesota State Bar Association
- Minnesota State Dental Association
- Minnesota Society of C. P. A.
- Minnesota State Pharmaceutical Assn.
- Minnesota Auto Dealers Association
- Minnesota Federation of Eng. Societies
- Minnesota State Veterinary Medical Soc.
- Hennepin County Medical Society
- Hennepin County Bar Association
- 11th Judicial Bar Association
- Minneapolis Association of Life Underwriters
- Minnesota State Life Underwriters Assn., Inc.
- Ramsey County Medical Society
- Ramsey County Bar Association
- St. Paul District Dental Soc.
- Minneapolis District Dental Soc.
- St. Cloud Dental and Stearns County Medical Society
- Duluth District Dental Society
- East Central Medical Society
- St. Louis County Medical Society
- West Central Dist. Dental Society
- Northwest Proprietors Association
- St. Paul Life Underwriters, Inc.

ACHROMYCIN*

Tetracycline *Lederle*

in the treatment of

infections in surgery

The prevention and control of cellulitis, abscess formation, and generalized sepsis has become commonplace technique in surgery since ACHROMYCIN has been available. Leading investigators have documented such findings in the literature.

For example, Albertson and Trout[1] have reported successful results with tetracycline (ACHROMYCIN) in diverticulitis, gangrene of the gall bladder, tubo-ovarian abscess, and retropharyngeal abscess. Prigot and his associates[2] used tetracycline in successfully treating patients with subcutaneous abscesses, cellulitis, carbuncles, infected lacerations, and other conditions.

As a prophylactic and as a therapeutic, ACHROMYCIN has shown its great worth to surgeons, as well as to internists, obstetricians, and physicians in every branch of medicine. This modern antibiotic offers rapid diffusion and penetration, quick development of effective blood levels, prompt control over a wide range of organisms, minimal side effects. There are 21 dosage forms to suit every need, every patient, including

ACHROMYCIN SF

ACHROMYCIN with STRESS FORMULA VITAMINS. Broad-range antibiotic action to fight infection; important vitamins to help speed normal recovery. In *dry-filled, sealed* capsules for rapid and complete absorption, elimination of aftertaste.

dry-filled sealed capsules

[1] Albertson, H.A. and Trout, H. H., Jr.: *Antibiotics Annual* 1954-55, Medical Encyclopedia, Inc., New York, N.Y., 1955, pp. 599-602.

[2] Prigot, A.; Whitaker, J. C.; Shidlovsky, B. A., and Marmell, M.: *ibid*, pp. 603-607.

Lederle

LEDERLE LABORATORIES DIVISION
AMERICAN CYANAMID COMPANY
PEARL RIVER, NEW YORK

*REG. U.S. PAT. OFF.

PHOTO DATA: AERIAL CAMERA WITH K-2 FILTER
AT DUSK, F.11, 4/100 SEC., FAST PAN FILM

ACHROMYCIN ACHROMYCIN

A NEW

Chemical Compound

for the treatment of

PEPTIC ULCERS and HYPERACIDITY

GLYCAMINE®

TABLETS

GLYCAMINE BRAND OF HYDROXY ALUMINUM
MAGNESIUM AMINOACETATE
PAT. PEND.

PROMPT, LONG LASTING RELIEF — One tablet is sufficient to neutralize excess acidity and maintain optimum pH for 4½ hours.

A NEW CHEMICAL COMPOUND — Designed to perform a specific function . . . not a mixture of alkalis. Will not disturb acid-base balance.

RE-ESTABLISHES NORMAL DIGESTION — Does not affect enzymatic activity. Improves patient well being.

CONTROLLED ACTION — Does not stimulate acid secretion or alkalosis. No acid rebound.

NON-SYSTEMIC — Neither constipating nor laxative. Demulcent protective coating covers abraded mucosa.

COMPATIBLE — With antispasmodics and anticholinergics. Reduces gastric distress caused by many drugs.

LOW DOSAGE — Only four pleasant tasting, chew-up tablets daily. Economical to use. Assures better patient co-operation.

AVAILABLE — In bottles of 100, 500 and 1000 tablets in all drug stores.

For latest professional information and samples write

DALCO PHARMACAL CO.

Minneapolis 2, Minn.

Division of

JOSEPH E. DAHL CO., Minneapolis and St. Paul

ongenital Peripheral Arteriovenous ommunications

e of Femoral Artery to Heart Circulation Time in Diagnosis

THOMAS O. MURPHY, M.D.,
SOL SANDHAUS, B.S., and
JOSEPH M. RYAN, M.D., F.A.C.P.

A CONCEPT of abnormal arteriovenous communications was first described by William nter[1] in 1757, however the presence of such mmunications as a normal physiological unit as a congenital malformation, was not discussed til the writings of Hoyer,[2] Schumaker,[3] osser[4] and others in the later nineteenth and entieth centuries. Recently, Pilulachs[5] and rdier[6] have suggested that some instances of nous varicosities are related to the presence of normal congenital peripheral arteriovenous mmunications, and have demonstrated their dings by arteriographic means. Thus, it seems at all individuals have peripheral arteriovenous mmunications present in the extremities and at the variations from normal are only one of gree (Fig. 1). However, in the abnormal state, mptoms of such malformations may range from e presence of simple varicose veins, to cardiac ilure.

The diagnosis of traumatic arteriovenous comunications is not a difficult one. The usual gns of a bruit, localized pain, and often a pulting mass, are due to a large blood flow via e artery to vein shunt. However, in small connital arteriovenous shunts, this is not true. The w via each such lesion is small, but the total tential of numerous communications may be ite large. Grant and Bland[7] have estimated the tal cross sectional area of potential arteriovenous mmunications, as represented by the glomus dies of the hand, to be over 1209 square cm., d even greater in the foot and leg. The flow a abnormal communications seldom represents such a tremendous transport of blood volume; however, in one instance in this series, the volume was enough to cause a marked cardiac enlargement in a six-year-old child without evidence of other cardiac disease.

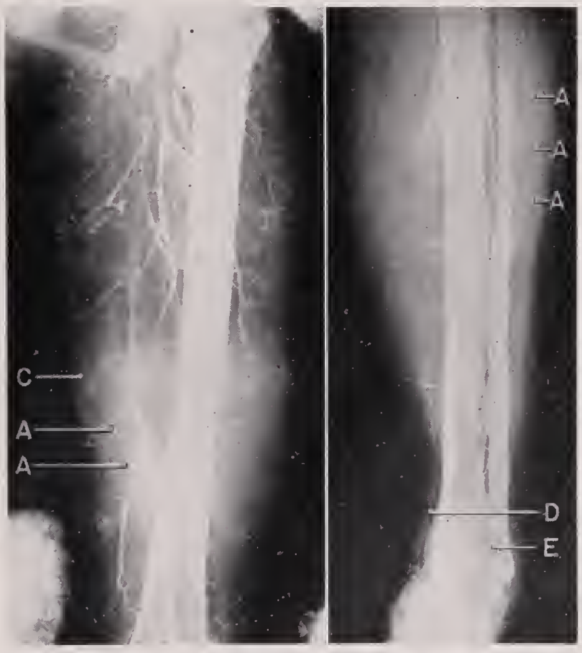


Fig. 1. Femoral arteriogram showing multiple peripheral congenital arteriovenous communications. (A) Abnormal segmentation of the main arterial stem. (C) Arteriovenous communication in the thigh. (D) Contrast material in the vein from communications around the ankle. (E) Contrast material in a vein from communications at the ankle and the foot.

Blood carbon dioxide and oxygen analyses studies may be used to give a measure of flow via these lesions. However, such determinations are expensive and necessitate the use of complicated laboratory instruments. Arteriographic demonstration of the lesions give a clear and definite idea of the communications, but necessitates hospitalization and a general anesthesia. The use of simple femoral artery to heart circula-

---

From the Surgical and Radio-isotope Laboratories of . Joseph's Hospital, St. Paul, Minnesota, and the edical School, University of Minnesota, Minneapolis, innesota.

Presented before the Minnesota Society of Internal edicine, October, 1955.

Dr. Murphy is a National Heart Trainee, USPHS.

TABLE I. CIRCULATION TIME. FEMORAL ARTERY TO RIGHT AURICLE APPEARANCE TIME

Normal Studies Age	Time
3 months	9.0 seconds
20 years	20.0 seconds
58 years	25.2 seconds
Adult Mean Time (12 studies)	21.0 seconds
Arteriovenous Communications	
6 years	1.0 seconds
19 years	8.5 seconds
21 years	7.8 seconds
32 years	8.8 seconds
46 years	6.6 seconds

tion time using a radioactive tracer element, I^{131}, presents a simple, safe and accurate means of diagnosis and study of these lesions.

Method

Thirty to 40 microcuries of iodine^{131} labeled human serum albumen in sterile saline, are injected rapidly into the femoral artery under local anesthesia, using a No. 20 hypodermic needle. A lead collimated scintillation counter, located over the right auricle, 1 to 3 inches above the xiphoid and to the right of the sternum, detects the appearance of the radioactivity when it arrives in this area. The radioactivity level detected by the counter is recorded continuously by a ratemeter and graphic recorder. The time from the injection to the appearance of radioactivity at the right auricle is called the femoral artery to heart appearance time.

During the procedure, the patient is placed in a constant temperature room at 20° C., in a condition approaching a basal state of activity. Under these conditions, the normal arteriovenous communications, the glomus units of heat regulatory control, should be closed.

The equipment used other than that necessary for any intra-arterial injections, include:

1. Tracerlab P-20 scintillation detector and mobile support stand.
2. Tracerlab SC-34 precision ratemeter.
3. Esterline-Angus (0-1 MA.) recorder.

Most of this equipment is found in the usual biomedical laboratory equipped for work with radioactive elements. The dosage of radioactivity administered is very small and may be repeated if necessary.

Results

Femoral artery to heart circulation times have been studied in a group of patients without demonstrable vascular disease, in ages from three months to fifty-eight years, and in both male and female patients (Table I). The adult range of norma lay between 20 to 25.2 seconds, while as expected in a small child the time was less, being 9. seconds in an infant of three months of age. Th adult mean time was 21 seconds.

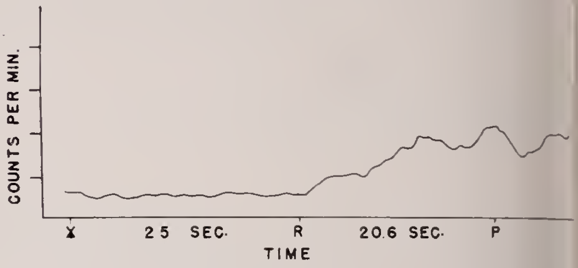


Fig. 2. Graphic representation of radioactivity a the right auricle in a normal study. (X-time of injectio into the femoral artery) (R-appearance of radioactivit at the right auricle).

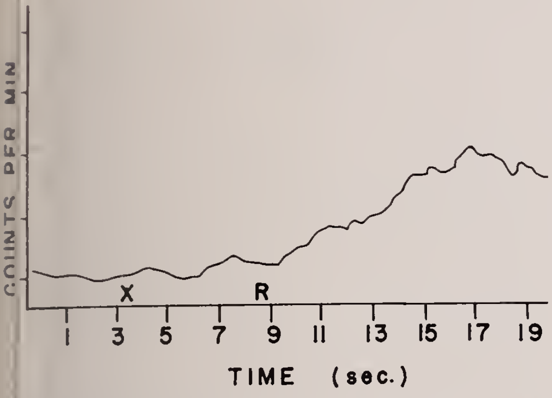
Five patients with abnormal arteriovenou communications were also studied. These lesion were later demonstrated by arteriographic studie in all, and a surgical exploration in an attempt o correction, in three of these patients. The rang of the circulation time in these instances was 1. seconds to 8.8 seconds. In none of this group i which these lesions were suspected, did the circula tion time even approach that of a three-month-ol normal infant (Figs. 2, 3 and 4).

Discussion

The rate of blood flow from the femoral arter to its return to the right heart is inversely pro portional to the degree of peripheral resistance i the arterial bed, and directly proportional to th "vis a tergo"* in the venous system. Thus, w may expect, that in the presence of arteriovenou malformations which do not respond to norma physiological control, that the peripheral resistanc of this area is lessened, and further, that there i a transfer of kinetic energy to the venous system As such, the rate of blood flow via this pathwa is increased. The measure of this flow rate wa attempted by Pilulachs,[5] using diodrast and it identification by taste sensation at the tongue The results in this experiment were crude due t the failure and delay of taste sensation. Secondl the contrast agent was a hyperbaric solution an of a high viscosity, which did not mix well wit flowing blood. The use of iodinated human seru albumen in this experiment has alleviated thes di culties. Further, the rapid formation of a fl level of radioactivity at the heart, following th injection of the test agent, indicates that a ve rapid diffusion of the "tagged" albumen th oughout the system takes place.

---

*"Force from behind."



ig. 3. Graphic representation of radioactivity at the ri t auricle in an abnormal study (arteriovenous com- ications). (X-time of injection into the femoral ar- e) (R-time of appearance at the right auricle.) culation time of 8:5 seconds.)

he correlation of the radioactivity curve at right auricle, to the degree of involvement o n extremity with arteriovenous malformations, h been attempted. To date, we have not been a to correlate the type or configuration of this ve to be of any significance. We do not see th "bicamel" type curve as described with the u of Evans Blue dye dilutions techniques,[8] pre- edly because the pick-up of radioactivity by th detecting tube is not shielded against the r rn of radioactivity following its transit th ough the lung and into the left heart. It is, ificant however, that in the one patient in w ch we have demonstrated massive numbers of formations, the appearance time at the right icle was the shortest of the series, one second.

Summary

simple diagnostic test in screening patients f the presence of small congenital arteriovenous c munications of an extremity is presented, with use of a femoral artery to heart circulation time using a radioactive tracer element, I^{131}. This is a simple and safe procedure, and one that may be carried out in any laboratory equipped for the use of radioactivity. It may be suggested that this same technique could be utilized to measure other blood transit times in evaluating the patency of porto-caval or spleno-renal shunts by injecting into a hemorrhoidal vein and measuring the time of arrival of radioactivity at the heart, and the problem of venous drainage of the extremity in the "post-phlebitic" syndrome.

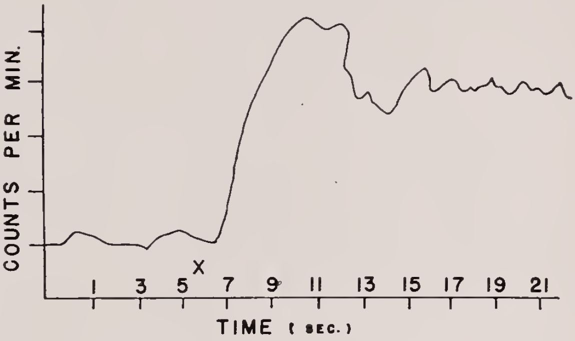


Fig. 4. Graphic representation of radioactivity at the right auricle in an abnormal study, arteriovenous communications. (X-time of injection into the femoral artery.) (Circulation time of 1.0 second.)

References

1. Hunter, W.: The history of aneurysms in general. Med. Obs. Soc. Phys., London, 1:323, 1757.
2. Hoyer, H.: Uber unmittelbare Einmundung kleinster Arterien in gafaussaste venosen Charakters. Arch. f. mikr. Anat., 13:603, 1887.
3. Schumaker, S.: Arterio-venose Anastomoses in de Zehen der Vogel. Arch. f. mikr. Anat., 87:309, 1906.
4. Grosser, O.: Arch. f. mikr. Anat., 60:191, 1902.
5. Pilulachs, P., and Vidal-Barraguer, F.: Pathogenic study of varicose veins. Angiology, 4:59, 1953.
6. Cordier, R.; Girard, A., and Trenez, G.: Abnormal arteriovenous communications, arteriographic aspects. J. de Rad. D'Elect., 36:402, 1955.
7. Grant, R., and Bland, E.: Observations in arterio-venous anastomoses in human skin and in the birds foot with special reference to the reaction to cold. Heart, 15:385, 1931.
8. Swan, H. J.; Zapata, J.; Diaz, J.; Burchell, H. B., and Wood, E. H.: Quantation of venous arterial shunts in congenital heart disease on the basis of dye dilution curves. J. Lab. & Clin. Med., 40:953, 1952.

TODAY'S HEALTH PROBLEMS

oday it is generally accepted that an educated and e ghtened group of citizens can and do best solve their o health problems, those of their families and their c munities. Moreover, the nature of today's health p blems—chronic disease, mental health, and accident p vention—demands that in addition to technical skills all health workers must be capable of utilizing educational and community organization procedures. We must not be guilty of telling people what to do, but we must help them become the kind of people who will know what to do.—L. E. Burney, M.D., *California Medicine*, January, 1956.

Accidents of Children

A Study of Accidents of Injured Children Seen at the Mayo Clinic in 1954

ARTHUR C. SMID, M.D., a
GEORGE B. LOGAN, M.
Rochester, Minneso

ACCIDENTS are responsible for more deaths in infants and children between the ages of one and fourteen years than the four most fatal diseases of childhood combined, namely, pneumonia, congenital defects, cancer and tuberculosis.[1] In 1952, although Minnesota had its worst epidemic of poliomyelitis, accidents accounted for the deaths of two and a half times as many children as polio did.[2] Despite the fact that nearly all childhood accidents are preventable, the death rate from accidents among children is being reduced only about a third as fast as the death rate from disease.[3]

Before the accident problem can be solved. it must be defined.[4-6] It is best defined by statistics: From 11,000 to 13,000 children are killed by accidents in the United States each year; that is, one-third the total number of children who die each year do so as the result of accidents. From 40,000 to 50,000 is an estimate of the number of children permanently injured each year in the United States by accidents.[7] Approximately 1,000,000 children receive medical care each year because of accidents.

The prevention of accidents to children then is a major and still unsolved problem. Its solution should be the concern not only of the pediatrician but of the general practitioner and all other physicians and surgeons who deal in some way with the care of children who are injured accidentally.

This study was undertaken to ascertain the types and causes of acute accidents to children in a small urban and rural community. During the year, 1954, Rochester and Olmsted County had only two hospitals, both affiliated with the Ma Clinic. A unique opportunity, therefore, was ava able for such an inquiry.

The study was limited to children less th fifteen years old who were seen either as ou patients in the emergency rooms or as inpatien in one of the two hospitals. Almost all of t children were from Olmsted County. Childr seen at home by physicians or treated by t parents without being seen by a physician we not included; nor were those who had sudd fatal injuries, such as drowning or being kill outright in an automobile accident.

This study therefore, encompasses the usu types of accidents seen in this kind of communit It is not a compilation of the extremely unusu or rare type of accident.

Method of Study

Data concerning the accidents and injuri were obtained from the records on file in t Mayo Clinic. The accidents were of four maj types: (1) home, (2) public, (3) motor vehic and (4) occupational (or school). Observation this classification immediately shows some ove lapping as the accidents in the public doma naturally would include many motor vehic accidents and others might be in the home are For our purposes we defined the groups follows:

Included as home accidents were any acciden which happened in or around the home prop Public accidents consisted of those that occurr away from the home. on the street, sidewalk any other place of public recreation, amusem or activity. Motor vehicle accidents consisted those in which the child was injured as passenger in an automobile, by collision of automobile, sudden stopping, or falling from moving vehicle. Accidents in which the child, a pedestrian, was injured by a motor vehicle, w classed as public accidents. Accidents result

---

Dr. Smid is a Fellow in Pediatrics and Dr. Logan is from the Section of Pediatrics, Mayo Clinic and Mayo Foundation.

The Mayo Foundation, Rochester, Minnesota, is a part of the Graduate School of the University of Minnesota.

Read at the meeting of the Northwestern Pediatric Society, Bayport, Minnesota, September 23, 1955.

m a closing car door, the majority of which curred in the home area proper, were included der the major classification of home accidents, if the injury occurred away from home as blic accidents. Occupational or school accidents ere those which occurred on the school grounds r in the school.

The principal cause of each accident was deter- ined. Causes were found to be falls, unsuper- sed activity, supervised activity, machinery, reign body, motor vehicles, poisoning, burns, rearms, suffocation and some miscellaneous ones. a sense unsupervised activities would cover any of the other causes. However, they have een listed separately because of their importance. this list of principal causes of accidents, cidents involving motor vehicles whether the ild was a pedestrian or passenger were con- dered to be due to motor vehicles. The only ceptions were the accidents due to closing of r doors and windows. Because of the specific ature of the injury and the rather large number f such accidents, these accidents were classed as eing caused by doors and windows.

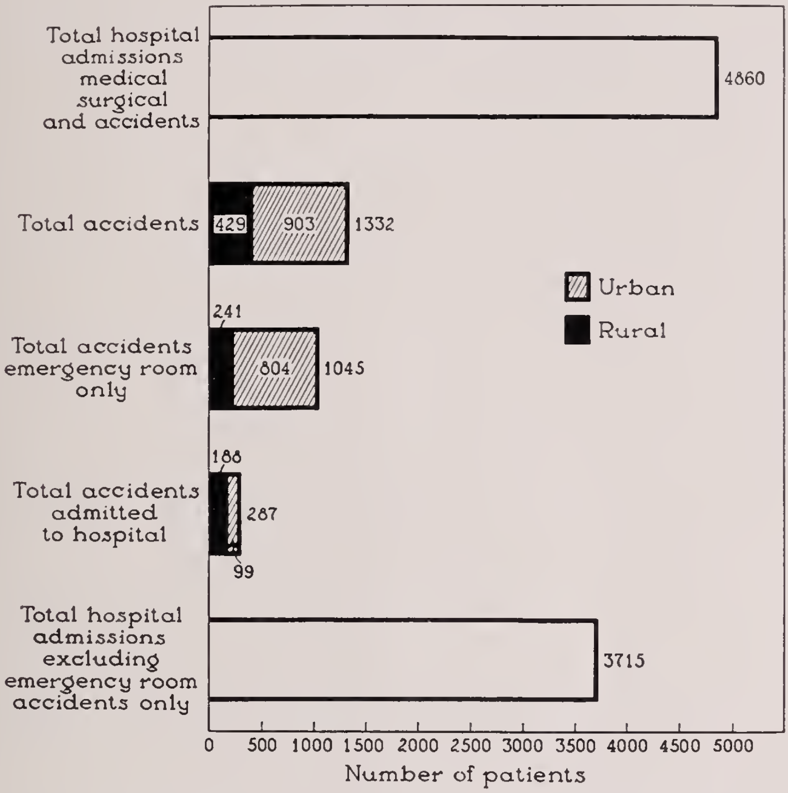


Fig. 1. Comparison of hospital admissions and accidents of children in Rochester in 1954.

It became apparent during the study that the terms "falls and miscellaneous" could more appropriately be considered as subdivisions in the groups of accidents due to (1) unsupervised and (2) supervised activities or play; or as (3) those associated with animals, foreign objects and door and window injuries.

Since accidents due to foreign bodies are more closely associated with children than adults, this cause of accidents was subdivided as to type: (1) aspiration or ingestion, (2) penetrating or cutting and (3) self-introduced.

Number of Children Injured

Of the 4,860 children seen in 1954 in the emergency rooms or in the hospitals of Rochester, 1,332 had had accidents (Fig. 1). Thus 27.4 per cent of the patients seen on the pediatric services under these circumstances were seen because they had injuries. Of the injured patients 903 were from the urban area and 429 from the rural area. One thousand forty-five of the children injured needed emergency room treatment only; 804 of these came from the urban area and 241 from the rural area. The remaining 287 children who were injured were hospitalized; ninety-nine of these were from the urban area and 188 from the rural areas.

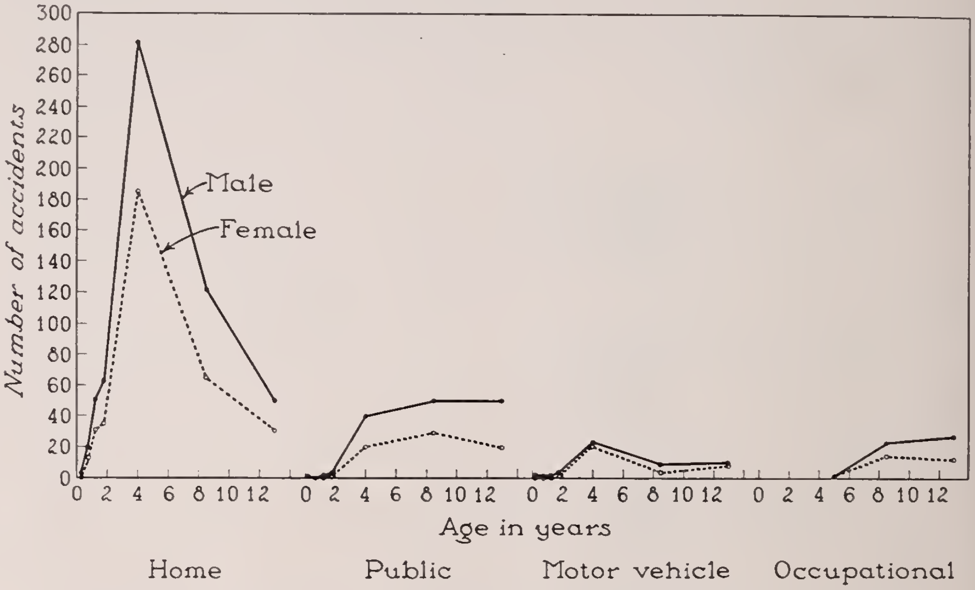


Fig. 2. Major classification of accidents of children according to sex and age.

The number of admissions to the hospitals' pediatric services for all causes in 1954 was a total of 3,815. Hence, approximately 7 per cent of our hospital admissions of children for 1954 were for injuries sustained in accidents.

Type of Accidents

The type of accident and the sex and age of the patients are indicated in Figure 2. In the entire group, there were 837 males and 495 females injured, a ratio of one female to 1.7 males.

The greatest number of accidents to our patients occurred in the home and involved children from two to five most frequently and those from six to ten years of age next. These home accidents numbered 953 (71.5 per cent of the total).

Two hundred seventeen accidents (16.3 per cent) occurred in public places. Children from six to fourteen years old were involved most frequently with about an equal number for ages six to ten and eleven to fourteen. Younger children had somewhat fewer accidents away from home.

The greatest number of children injured as passengers in or by motor vehicles was in the age group of two to five years. The total number c children having motor vehicle injuries a passengers was eighty-four (6.3 per cent).

Seventy-eight children (5.9 per cent) were ir jured in occupational types of accidents. The tw occupational accidents in the age group of two t five years were those of two five-year-old childre who were in kindergarten.

Urban Versus Rural Accidents

Nine hundred and three children were injure in the city and 429 in the rural areas. Figure relates the type of accident to its occurrence i the city or in a rural area. The ratio of urba accidents to rural accidents is 2:1 in this series c cases.

The 1950 United States[7] census indicated that total of 12,803 children through the age of fou teen years were living in Rochester and Olmste County areas. Of this total, 6,682 children we in urban Rochester and 6,181 were in the rur areas of Olmsted County. The total figures ar undoubtedly somewhat higher for 1954, but th ratio of urban children to rural children is prob ably the same. From use of the 1950 census figur and the 1954 hospital-accident figures, the in cidence of urban accidents was one accident f every seven children, and the rural incidence w one for every fourteen children.

The unusually high incidence of urban acciden this series may be accounted for in part by the se with which children of the community can brought to the hospitals for all types of emerncy treatment.

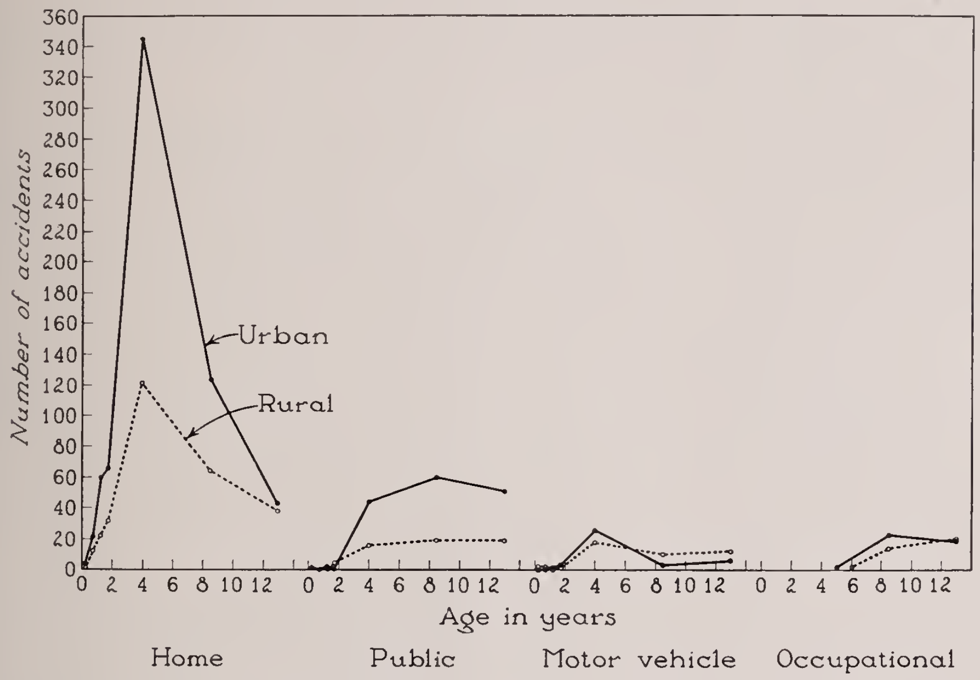


Fig. 3. Major classification of accidents of children according to locality, urban and rural, and to age.

A critical analysis of the figures on the principal use of the accidents will show that more rural an urban children were injured by motor ehicles (both as pedestrians and passengers) and achinery. Further evidence of the seriousness of ral accidents will be discussed later in relation the residual resulting from the accidents.

Principal Causes

The principal causes of the accidents in relation age and sex of the children and site of the ccident, whether urban or rural, are listed in ables I and II. A few of the principal causes ere subdivided to show the type of accident more learly. Accidents of similar nature were classed nder several principal causes. For example, njuries resulting from falls were listed under unupervised activity and supervised activity, whichver category was correct. Falls accounted for a ombined total of 487 accidents, both urban and ural, or 36.6 per cent of all accidents.

Unsupervised outdoor activities were the prinipal cause of accidents; the total was 293 accidents (22 per cent). The next largest number of accidents occurred during unsupervised indoor activity, including falls from the porch or windows and other injuries, accounting for a total of 291 (21 per cent). Foreign-body accidents caused 201 injuries (15 per cent). These three principal causes together accounted for almost three-fifths of the accidents; that is 58.9 per cent. The remainder of the causes of accidents and the total number of cases encountered are: motor vehicle (pedestrian and passenger exclusive of door and window injury), 114 cases; supervised activities, ninety cases; poisoning, eighty-eight cases; machinery, fifty-nine cases; burns, forty-eight cases; firearms, four cases; suffocation, three cases; and miscellaneous, 141 cases, of which thirty-six cases were due to foreign objects such as rocks and stones, forty-six cases to animal type of accidents such as bites, scratches or falls, and fifty-nine cases to door and window injuries.

Frequency of Injury in Certain Age Groups.—From both Tables I and II it may be seen that children between the ages of two and five years are injured accidentally much more frequently than those of other age groups. There was a total of 575 children from two to five years old (43

TABLE I. PRINCIPAL CAUSES OF 903 ACCIDENTS OF URBAN CHILDREN

Principal Cause	Total		Age and Sex													
			Less than 6 mo.		6-11 mo.		12-17 mo.		18-23 mo.		2-5 yr.		6-10 yr.		11-14 yr.	
	Number	Per Cent	M	F	M	F	M	F	M	F	M	F	M	F	M	F
Unsupervised activities (out of doors)	213	23.6					4	2	4	3	60	33	53	28	21	5
Falls	150	16.6					4	1	2	2	38	25	36	19	19	4
Miscellaneous	63	7.0						1	2	1	22	8	17	9	2	1
Unsupervised activities (in or about the house)*	229	25.3		2	7	6	16	6	23	12	67	48	15	19	3	5
Falls	197	21.8		2	6	6	15	5	21	10	57	42	12	16	1	4
Miscellaneous	32	3.5			1		1	1	2	2	10	6	3	3	2	1
Foreign bodies	133	14.7	1		2		2	3	7	2	40	24	20	8	14	10
Penetrating	101	11.2					1	3	5	1	32	13	16	6	14	10
Aspiration-ingestion	23	2.5	1		2		1		2		4	8	3	2		
Self-introduced	9	1.0								1	4	3	1			
Motor vehicle†	54	6.0					1		2	1	17	12	8	2	8	3
Supervised activities	66	7.3		1							4	2	18	11	20	10
Falls	21	2.3									2	1	5	7	4	2
Miscellaneous	45	5.0		1							2	1	13	4	16	8
Poisoning	58	6.4			2	1	9	3	6	2	19	15				1
Machinery	23	2.6									9	6	1	1	2	4
Burns	26	2.9					5	4			5	6	4		1	1
Firearms	2	0.2											1		1	
Suffocation	2	0.2	1								1					
Miscellaneous	97	10.8			2		4	2	6	1	28	24	9	12	5	4
Door and window	45	5.0			1		4	1	3	1	16	10	2	3	1	3
Animal	25	2.8						1	2		3	10	2	5	1	1
Foreign object	27	3.0			1				1		9	4	5	4	3	
Total	903	100.0	2	3	13	7	41	20	48	21	250	170	129	81	75	43
Grand Total			5		20		61		69		420		210		118	

*Indoor activities, including falls from the porch.

†Includes all types whether public, that is, pedestrian or passenger. Excludes doors and windows.

per cent) of the total. The 1950 United States census statistics for Rochester and Olmsted County list approximately 4,034 children between the ages of two and five years in this area, about 32 per cent of the total number less than fifteen years of age. Though the 1954 population figures are undoubtedly increased, the age-group proportions and percentage of children are probably the same.

These figures then tend to substantiate the findings of others[4,6] that children between the ages of two and five years are injured more frequently by accidents than children in any other age group.

Types of Injury

The types of injuries are grouped in order of frequency in Table III. Lacerations accounted for 38.2 per cent of the total injuries.

A few of the objects responsible for penetrating and cutting injuries in order of frequency are (1) metal objects such as cans, coat hangers, and metal toys, (2) nails, (3) glass, (4) wood, (5) utensils, both kitchen and garden, (6) arrows or darts and (7) a miscellaneous group.

The ingestion or aspiration of foreign bodies constitutes a small (forty-eight cases) but significant number of accidents. The kinds of objects in the order of frequency were (1) coins, (2) foodstuffs such as peanuts, fishbones, popcorn meat, carrots, orange peel and egg shells, (3 metallic objects as bolts, screws and tacks, (4 pins and buttons and (5) glass beads and marbles The most unique object was a lead cow-bel clapper.

Self-introduced foreign bodies were found mos commonly in nasal passages, occasionally in th external auditory canal and rarely in the vagina The various types of objects in order of frequenc were pins, buttons, glass beads, paper, gum an crayons.

Poisoning is an important cause of accidents There were eighty-eight children in our grou who were injured in this way. A partial list o the different types of poisons includes in order o frequency: aspirin, turpentine, fuel oils, arsenic dilantin, lye or bleach, liquid soaps, nicotine, insecticides and single instances of poisoning by a great variety of medicines and other substances t which children have access in homes.

Here as elsewhere,[8] aspirin is an important an dangerous cause of poisoning. The same may b said of turpentine and fuel oil both of which ar often easily accessible in soft-drink and othe lightly stoppered or unstoppered bottles. The eas accessibility of these and other things (the fault of an adult) is responsible for the poisonings.

TABLE II. PRINCIPAL CAUSES OF 429 ACCIDENTS OF RURAL CHILDREN

Principal Cause	Total		Age and Sex													
			Less than 6 mo.		6-11 mo.		12-17 mo.		18-23 mo.		2-5 yr.		6-10 yr.		11-14 yr.	
	Number	Per Cent	M	F	M	F	M	F	M	F	M	F	M	F	M	F
nsupervised activities (out of doors)	80	18.6				1	1	1	1	1	24	4	23	9	10	5
Falls	55	12.8				1	1		1		12	3	20	8	5	4
Miscellaneous	25	5.8						1		1	12	1	3	1	5	1
nsupervised activities (in or about the house)*	62	14.4			2	1	2	3	5	2	22	13	5	2	5	
Falls	52	12.1			2	1	2	3	4	2	19	10	5	2	2	
Miscellaneous	10	2.3							1		3	3			3	
reign bodies	68	15.9			2	2		1	7	4	14	9	11	7	5	6
Penetrating	35	8.2							2	2	3	6	9	4	4	5
Aspiration-ingestion	25	5.8			2	2		1	5	1	8	1	1	2	1	1
Self-introduced	8	1.9								1	3	2	1	1		
otor vehicle	60	14.0	2		1				3	2	12	12	10	4	7	7
pervised activities	24	5.6											5	4	10	5
Falls	12	2.8											4	3	2	3
Miscellaneous	12	2.8											1	1	8	2
isoning	30	7.0					3	3	5	2	9	6		1	1	
achinery	36	8.4					2	1		1	7	7	8	2	8	
urns	22	5.1		1	3	1	2	2		3	3	2	3		2	
irearms	2	0.5													1	1
uffocation	1	0.2	1													
iscellaneous	44	10.3	1				2			1	6	5	9	3	13	4
Door and window	14	3.3	1				2			1	4	1	2	2	1	
Animal	21	4.9									1	3	2	1	10	4
Foreign object	9	2.1									1	1	5		2	
otal	429	100.0	4	1	8	5	12	11	21	16	97	58	74	32	62	28
rand Total			5		13		23		37		155		106		90	

Indoor activities, including falls from the porch.

TABLE III. TYPES OF INJURIES IN 1,332 CHILDREN

Types of Injury	Total	Urban				Rural			
		No.	%	M	F	No.	%	M	F
Lacerations	540	399	28.2	280	119	141	10.0	94	47
Fractures and dislocations	220	111	7.9	60	51	109	7.7	70	39
Contusions	197	134	9.5	75	59	63	4.5	36	27
Head injury	117	71	5.0	41	30	46	3.3	31	15
Abrasions	112	77	5.4	41	36	35	2.5	21	14
Poisoning	88	58	4.1	36	22	30	2.1	18	12
Burns	48	26	1.8	15	11	22	1.5	13	9
Aspiration or ingestion	48	23	1.6	13	10	25	1.8	17	8
Sprains	24	20	1.4	13	7	4	0.3	3	1
Crush injury	14	3	0.2	3	—	11	0.8	10	1
Gunshot	4	2	0.1	2	—	2	0.1	1	1
Suffocation	3	2	0.1	2	—	1	0.1	1	—
Total	1,415	926*	65.3	581	345	489*	34.7	315	174

*Some children had more than one type of injury in a single accident.

Permanent Disabilities

Of the fourteen urban children in the total of 903 who suffered permanent disability, two were less than two years of age; the youngest was eleven months of age; four were between two and five years, three were six to ten years and five were eleven to fourteen years. Of the thirty-nine rural children who incurred disabilities, six were less than two years of age; the youngest was ten months; nine were two to five years old, nine six to ten years and fifteen were eleven to fourteen years old.

The types of accidents which gave rise to the permanent disabilities of the urban children were in order of frequency: unsupervised activities, foreign bodies, and firearms, three cases each; burns, two cases; and suffocation, animal and door and window injuries, one case each. Some of the residua of these fourteen urban children were peripheral nerve palsies with associated loss of function, traumatic cataracts, extensive scarring with contraction deformities, amputations and a single case of decerebrate rigidity (the result of accidental hanging).

The types of accidents of rural children that resulted in permanent disability are decidedly different from the foregoing and include ten due to machinery, eight to burns, seven to foreign bodies, six to motor vehicles, four to animal injuries, three to unsupervised activity and one to poisoning.

The permanent damage resulting from the

accidents of the rural children include in order of frequency: (1) peripheral nerve palsies with loss of function; (2) extensive scars with contraction deformities; (3) loss of function of a whole or part of an extremity without nerve injury; (4) amputations, varying from loss of a single phalanx to loss of an entire leg; (5) severe keloids; (6) strictures (both esophageal and urethral); (7) traumatic cataracts, and (8) total enucleations of an eye.

TABLE IV. ACCIDENTS OF CHILDREN:
HOSPITAL STAY AND LENGTH OF DISABILITY

	Urban			Rural		
		Days			Days	
	Patients	Hospitalized	Of Disability	Patients	Hospitalized	Of Disability
Unsupervised activities (in or about house)*	16	81	436	19	91	236
Unsupervised activities (out of doors)	24	121	906	22	210	1,599
Supervised activities	6	35	120	9	48	348
Motor vehicle	9	58	112	31	660	2,510
Foreign bodies	14	91	501	29	170	240
Aspiration		48			80	
Penetrating		43	501		90	240
Poisoning	12	31	—	14	78	300
Burns	7	205	459	14	774	1,776
Firearms	2	18	24	1	33	90
Suffocation	1	15	—	1	2	—
Miscellaneous	8	100	199	21	237	1,865
Foreign objects		76			30	659
Animal		17			201	1,192
Door and window		7			6	14
Machinery	—	—	—	27	347	2,300
Total	99	755	2,757	188	2,650	11,264
Average days per patient		7.6	27.8		14.1	59.9

*Indoor activities, including falls from porch.

There was one case of permanent disability for every sixty-five urban accidents, and one for every eleven rural accidents. The over-all ratio was one case of permanent disability for every twenty-five accidents.

Whereas we encountered fewer accidents among children from our rural areas, those who were seen were more severely injured and more of them had permanent disabilities than did those from the urban area.

Fatal Accidents

Seven children died as a result of injuries: five were males, and two, females. Two were urban and five were rural.

Three of these, aged three days, eleven months, and seven years, respectively, died as a result of a foreign-body type of injury. The specific type in two cases was aspiration of formula and egg shells, and in one case, penetration of a wooden stick which pierced the child under its eye and entered the brain.

Two children, aged twenty-two months and six years, were injured fatally in motor vehicle accidents. In each instance the child was pedestrian and had been struck by a motor vehicl

One child, aged eight years, was injured fatal when she fell from a second story window at h home. A twelve-year-old boy was injured fatall when his chest was crushed by a grain wagon.

These seven fatal accidents represent an over-al ratio of one death for every 190 accidents. Th urban incidence rate was one death for every 45 accidents, and the rural fatality ratio was on death for every eighty-six accidents.

Duration of Stay in Hospital and Disability

The duration of the stay in the hospital an length of disability is given in relation to the kin of accident and to whether it occurred in th urban or rural area in Table IV.

The incidence rate of hospital admissions fo urban children was one for every 9.1 accidents for rural children one for every 2.3 accidents.

The ninety-nine urban patients spent a total o 755 days in the hospitals or an average of 7. days per patient. The total number of days o disability of the children injured in the urba area was 2,757 or an average of 27.8 days pe patient.

The 188 patients injured in rural areas spen a total of 2,650 days in the hospital, an average o 14.1 days per patient. The total number of da of disability of these rural children was 11,26 an average of 59.9 days per patient.

In 1954 about twice as many children accidentally injured in rural areas as in urban areas were hospitalized. The average duration of hospitalization was more than twice as long for the children rom the rural areas. Two types of accidents ontributed chiefly to the more prolonged hositalization of children injured in rural areas: urns and motor vehicles. Children whose burns ccurred in rural areas were hospitalized on an verage of twice as long (55.2 days as compared o 29.3 days) as those burned in the city. This ndicates more severe burns among the rural hildren.

Three types of accidents contributed chiefly to he prolonged period of disability suffered by hildren injured in rural areas: burns, motor ehicles and machinery. We encountered no nachinery injuries among urban children ufficiently severe to warrant hospitalization. The verage hospital stay of 12.9 days and disability f 85.2 days among those injured by machinery n the farm should emphasize the increased azard of living on farms since they have become nechanized. It behooves farm parents to see that he farm machinery is carefully operated and that ractors and other machines are not entrusted to hildren who are not capable of operating them.

Comment

It is generally agreed that most accidents mong children are preventable. It can be stated lso that adults are responsible for an extremely arge number of the accidents that befall children.

To show these facts more clearly our study reealed that 71.5 per cent of the total number of ccidents were home accidents and that children n the preschool age group, that is, two to five ears, were injured about twice as frequently as vere children of any other age. For at least hree-fourths of the total accidents the parents ould be held directly or indirectly responsible.

It is apparent that prevention of accidents must nclude not only protection of the child but also ducation of the child and of all adults whose ttitude is that, "Well, accidents are bound to appen, so what." Unless the family physician r pediatrician provides the education and supports a co-ordinated state-wide educational proram, many families will not be given any "safety accine."[9] This term has been coined to stress he necessity of adequate safety education. Its mission is as grievous as failure to administer rotection against smallpox, diphtheria, tetanus nd whooping cough.[10]

We as physicians and surgeons must educate urselves to the problems of preventing accidents in children. We must emphasize the importance of accident prevention to our medical students, interns, residents, patients and parents of patients.

Summary

In 1954, 1,332 infants and children who had experienced acute accidents were seen at or admitted to the hospitals affiliated with the Mayo Clinic. Of this total, 903 came from the urban area and 429 were from the rural area; a ratio of 2:1. The ratio of accident to nonaccident hospital visits was 1:3.6 and that for hospital admission was 1:13.3.

The largest number of accidents were in the major classification of home accidents.

Two hundred seventy-eight patients (188 from rural and ninety from urban areas) were admitted to the hospitals because of accidents. The average number of days in the hospital per patient was 14.1 and 7.6, respectively, for rural and urban children. The average number of days of disability was 27.8 for patients from urban areas and 59.9 for those from rural areas.

Fifty-three children had permanent disability, one for each twenty-five accidents; seven fatalities occurred, one for each 190 accidents.

These facts emphasize the need for a better and more co-ordinated program for accident prevention in Minnesota. In order to promote an effective program doctors must develop an interest in and desire to eradicate accidents as a killer and disabler of children.

References

1. Powers, J. H., and Lincoln, J. E.: Accidents during infancy and childhood. New York J. Med., 53: 2957-2961 (Dec.) 1953.
2. Rosenfield, A. B.; Allen, William, and Storey, E. W.: Accidents—chief killer of children. Minnesota Med., 36:1141-1148, 1953.
3. Smith, Austin: Accidents in children. (Editorial.) J.A.M.A., 154:61-62 (Jan. 2) 1954.
4. Dietrich, H. F.: Accident prevention in childhood is your problem, too. Pediat. Clin. North America, pp. 759-768 (Nov.) 1954.
5. Dietrich, H. F.: Prevention of childhood accidents. J.A.M.A., 156:929-931 (Nov. 6) 1954.
6. Shaffer, T. E.: Accident prevention. Pediat. Clin. North America, pp. 421-431 (May) 1954.
7. Population Census Report (1950). [P-B23 Preprint of Volume 11, Part 23, Chapter B.] Washington, D. C.: U. S. Government Printing Office, 1952, pp. 23-93.
8. Arena, J. M.: Poisoning in infants and children. Pediat. Clin. North America, pp. 771-784 (Nov.) 1954.
9. American Academy of Pediatrics Committee on Accident Prevention: Rx: Are You Using the New "Safety Vaccine"? [Pamphlet.] 14 pp.
10. Minnesota Department of Health: Table of Immunization. (Feb.) 1955.

Case Presentation

Transitional Hydatidiform Mole with Fulminating Pre-eclampsia and a Macerated Fetus

FRANCIS M. SWAIN, M.D
Minneapolis, Minnesot

THIS case report, prompted by a somewhat similar one by Berry, Swerdlow and Edwards,[2] concerns a patient who developed a severe fulminating pre-eclampsia at twenty-one weeks gestation and was found to have a well-formed fetus accompanied by a transitional hydatidiform mole.

Typical hydatidiform moles are rather uncommon. Chesley, Cosgrove and Preece[4] found fifty-seven during a period when there were 75,000 deliveries, or an incidence of 1:1,321. Hertig and Edmonds[7] gave the incidence as 1:2,062 (term pregnancies). The same authors[7] quote Boivin as stating the incidence of moles in the second trimester of pregnancy is 1:20,000 pregnancies. The term "transitional hydatidiform mole" was first used by Hertig and Edmonds[7] in the article "Genesis of Hydatidiform Mole" (1940). However, in this same article they credited Gierse and Storch with suggesting that there existed some intermediate (or transitional stages) between the hydatid changes seen in the early abortus and the full-blown variety seen in the typical mole.

Hertig and Edmonds[7] found that 50 per cent of the early abortuses were pathologic ova, in which the embryo was either absent or imperfectly developed. There was some hydatidiform degeneration of the chorionic villi in these pathologic ova. They found that 80 per cent of the classic moles consist only of masses of typical hydatidiform villi. Occasionally there may be an empty chorion cavity or an amnion with or without a tiny nodular embryonic mass. In between the two extremes (of the early abortus and the classic mole) there lies the transitional type. The average age of the pregnancy in these cases was found to be 16.6 weeks (menstrual age). Hertig and Edmonds[7] found fifteen of the transitional type in their series for an incidence of 1.44 per cent. Of the fifteen, four had small macerated fetuses present; in the other eleven there w only an empty chorionic sac or an amnion cavit with a tiny nodular embryo. The chorionic vil ranged from normal villi, to large ones with vesse present, on to true hydropic villi without vessel Usually there were enough grossly cystic ones t allow a diagnosis of a hydatidiform mole.

Case Report

Mrs. C. G. was a twenty-eight-year-old woman, par four. All her previous pregnancies had terminated normal spontaneous deliveries of normal infants whic weighed seven and one-half to eight pounds. She ha no history of hypertension or nephritis. She was fir seen by me May 2, 1953, with a history of her la period beginning on February 15, giving her a due dat of November 22, 1953. She was Rh positive, her bloo pressure was 120/80, urinalysis was negative and physic examination was negative except findings of a norm early pregnancy (ten weeks size). Her next visit w on June 5, when no abnormalities were found. O her visit June 26, she stated she had had some vagin bleeding of slight amount on one day since her pr vious visit. Blood pressure and urine were negativ About July 11, the patient called on the phone to sa that her legs were swelling considerably; she was p on a low salt diet and asked to come in for a chec up in a few days if she were not feeling better. O July 14, she came in complaining of swelling, spo before the eyes, and not feeling well generally. She w found to have gained 18½ pounds in five weeks, mo of it since her last visit two weeks previously. H blood pressure at this time was 180/120, there was 3-plus albuminuria, the fundus of the uterus was abo mid-way between the umbilicus and the xiphoid proce no fetal heart sounds were heard, and there was 3-plus pitting edema of the pre-tibial-area.

The patient was hospitalized immediately and plac on conservative toxemia therapy. This consisted of b rest, low salt diet and sedation with morphine, ma nesium sulfate phenobarbital and paraldehyde. Ph ical examination showed some minimal localized spa of arterioles of the eyegrounds, and some left cost vertebral tenderness, besides the findings noted pr viously. Urine showed 1-plus albuminuria and ma clumps of white blood cells; the hemoglobin was grams per cent. Impressions at this time were: (early fulminating pre-eclampsia, (2) the same plus

---

From Maternity and Mt. Sinai Hospitals.

datidiform mole, (3) acute nephritis, or (4) acute low atrophy. Additional laboratory reports were: ic acid 4.3 mg. per cent, blood urea nitrogen 22.3 . per cent and an icteric index of 8. Since the tient had tenderness over the left kidney and many s cells in the urine, she was placed on penicillin and eptomycin.

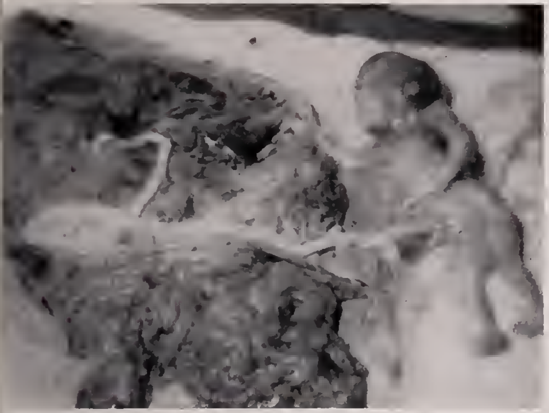
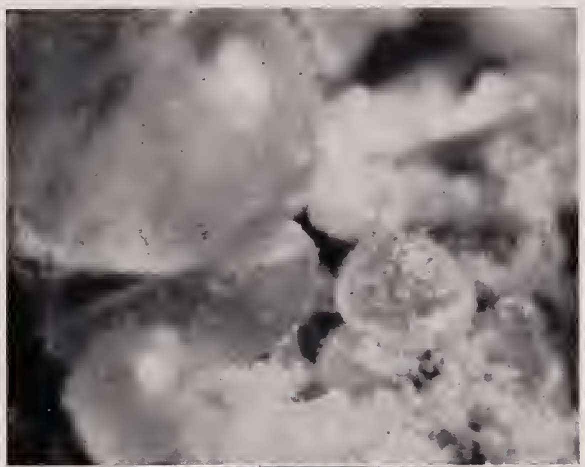


Fig. 1. Gross specimen. Slightly macerated 8-inch ig fetus. Large placenta with areas of grape-like sicles.

An x-ray examination of the abdomen was ordered cause the uterus was a month and a half to two onths larger than it should have been. There was oorted no definite fetal structures although there re some shadows which might represent a small fetal oracic cage. A quantitative test for chorionic gonotropin was done and revealed that there was more an 200,000 mouse units per liter (80,000 m.u. being e upper limit in normal pregnancy).

Since definitive treatment of the toxemia seemed gent (no improvement after thirty-six hours), and ice it was felt that there was a hydatidiform mole esent either with a dead fetus or no fetus, it was deled to interrupt the pregnancy. The blood pressure e day after admission was still 175/120, her intake was 100 cc. with an output of only 950 cc. Because the erus was so large an abdominal hysterotomy was done July 16, using N_2O-O_2, pentothal, and curare anesesia. On opening the uterus through a classical type cision it was found to be about term size and quite t. The uterus was almost completely filled by a very ge and edematous placenta which was covered by any grape-like cystic villi. In one portion of this acenta was a sac which contained a well-developed acerated fetus which measured 20 centimeters (8 hes) from crown to heel. The entire specimen is n in Figure 1. The cystic structures are shown ssly and microscopically in Figures 2 and 3. The stic villi ranged in size from several millimeters to a ntimeter or more in diameter. The entire placenta is covered with areas of many cystic villi and in tween these areas the tissue was merely edematous. ie placenta measured about 10 by 20 inches by 1 to inches in thickness.

The uterine and abdominal wall incisions were repaired in routine fashion and the patient given two pints of blood. The patient was afebrile postoperatively with antibiotics. The blood pressure was down to 140/90 by the morning after operation and remained at that level. On the day of surgery her intake was 2100 cc. with an output of 350 cc. On the first postoperative day the output was equal to the intake and for the next three days it exceeded the intake. She was discharged in good condition on the seventh postoperative day.



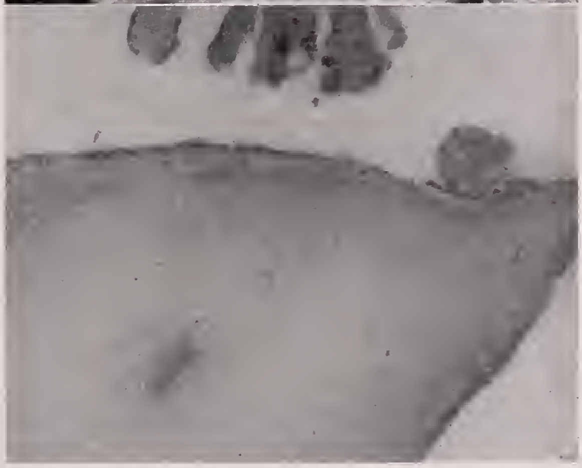


Fig. 2. *(above)* Gross specimen. Close-up view of cystic villi, three times actual size.

Fig. 3. *(below)* Microscopic section of a typical hydropic villus, magnification X 600.

Follow-up.—On August 5, the blood pressure was 120/80, the urine was negative and a pregnancy test was reported negative. She was seen at monthly intervals for about nine months with negative findings reported. The patient did not come in for a check-up from May, 1954, until September, 1954. In mid-September when she did come in she said her last period was July 21, 1954. On examination it was found she was about two months pregnant. She was checked at frequent intervals and proved to have a completely normal pregnancy. The course of this pregnancy was without signs of toxemia or bleeding, et cetera. A few weeks before term it was decided to deliver her by repeat cesarean section since her previous operation had been a classical type. This was done on April 15, 1954, at Mt. Sinai Hospital, Minneapolis, Minnesota. At operation the previous uterine incision was attenuated to such a degree that it was paper-thin. In view of the danger of leaving such a scar and since she had five living children, a sub-total hysterectomy was done. Both the patient and her new baby did well afterwards and were discharged from the hospital in good condition. She was seen in the office on May 4, June 1, and August 3, 1955, and was found to be doing very well.

Comment

The fetus in the case presented measured 8 inches or 20 centimeters, approximately eighteen weeks (menstrual age) gestation. The slight degree of maceration, however, might indicate that death had occurred less than three weeks before delivery.

Novak[10] states that the three pathological changes which characterize hydatidiform mole are: (1) trophoblastic proliferation, (2) hydropic degeneration of the villous stroma, and (3) scantiness of blood vessels. Some of the villi in the case reported showed these changes microscopically, as well as being grossly cystic and hydropic. Others were normal in appearance. The morphologic character of the specimen with the clinical picture of a fulminating pre-eclampsia at twenty-one weeks gestation makes the diagnosis of a hydatidiform mole. However, since there are some normal villi present and since there was a fetus present, it is a transitional hydatidiform mole rather than a typical or classical one.

Chesley, Cosgrove and Preece[4] state that 10 to 40 per cent of moles are complicated by a true toxemia of pregnancy and quote Hitschmann as saying that 30 per cent incidence of toxemia is about average. Compared with Eastman's[6] 6 to 7 per cent incidence of toxemia of pregnancy in general, it is obvious this complication is much more frequent with molar pregnancies. In fact, probably one should be suspicious of a hydatidiform mole when a fulminating pre-eclampsia develops in the first half of pregnancy. Chesley, Cosgrove and Preece,[4] in reviewing thirty-six cases of molar pregnancy accompanied by eclampsia, noted that there was a definite fetus found in seven cases. Melody[8] reported a case of hydatidiform mole with a four months' size fetus and complicated by a fulminating toxemia, very similar to this author's case. Melody's case was treated by interrupting the pregnancy by means of an anterior vaginal hysterotomy. The villi in his case also showed some to be normal while some were hydropic without vessels.

In the article by Hertig and Edmonds[7] it wil be noted that approximately one-fourth of the transitional moles had well-formed fetuses present Hertig stated he has seen only one case of hydatid degeneration of the placenta with a fetus of more than twenty-eight weeks. Cline[5] reported a case of a mole with a six to eight week fetus present Mueller[9] had a patient who delivered at thirty fours weeks, a 3 pound 14 ounce baby with a placenta in which there was 75 per cent involvement in hydatidiform degeneration. Mueller also gave references to five other similar cases Beltz and Hutchins[1] reported a patient who at thirty-seven weeks gestation was delivered by cesarean section of a 6 pound ½ ounce living child with a placenta previa accompanied by a separate mass of molar tissue. It is probable this may have been a twin pregnancy. Also, Bowles[3] reported on a patient who developed a mild pre-eclampsia at seven and one-half months and was induced. She delivered a normal living baby of 4 pounds 6 ounces. Following this she delivered a 4 pound 6 ounce hydatidiform mole also. In this report Bowles quotes Meyer as finding in a collection of moles at the Carnegie Institute of Embryology, that 66.4 per cent of them contained a fetus in an excellent state of preservation. Their average age was 66.6 days.

Summary

A case of transitional hydatidiform mole with severe fulminating pre-eclampsia developing at twenty-one weeks' gestation, and accompanied by a well formed fetus of approximately eighteen weeks' size has been presented.

A short discussion has been given on the incidence of hydatid degeneration and the incidence and character of the transitional variety. Approximately 4 per cent of all pregnancies are involved in hydatidiform degeneration of some sort and of these 1.44 per cent are transitiona moles. About 25 per cent of these transitiona hydatidiform moles are present with a wel formed fetus. Apparently in these cases the fetu lives as long as there is enough normally functioning placental tissue to sustain it. The in

(Continued on Page 412)

eminar

HE PYRROL PIGMENTS AND HEMOGLOBIN CATABOLISM

C. J. WATSON, M.D.
Minneapolis, Minnesota

(Continued from May Issue)

rum Bilirubin and the van den Bergh Reaction

Since the epoch-making discovery of van den rgh, Snapper and Mueller in the application of Ehrlich-Pröscher diazo reaction to the quanti-ive determination of the serum bilirubin and, iat has proven of greater interest, the different es of reactions which occur with different forms jaundice,[39] there has been a great deal of study the fundamental basis of these differences, de-te which there is still disagreement and lack of act knowledge.

It is well known that van den Bergh observed a ompt direct diazo reaction with bile in general, blood serum from patients with jaundice in iich it was reasonable to suppose that bile was ing regurgitated into the blood. In this con-ction van den Bergh spoke of obstructive jaun-ce, but it is clear that this applies to intrahepatic olangiolar disturbance as well as ordinary me-anical obstructive jaundice of extrahepatic type. contrast, the serum from patients with perni-us anemia and hemolytic anemia, and normal rse serum, which contains a relatively large iount of bilirubin, all gave an indirect or de-ed type of reaction. Van den Bergh could not cide whether these different reactions were due some minor chemical variation in the molecule elf or to some substance in the bile causing the irubin to react in a prompt direct fashion, hough he favored the former explanation. If latter, it was necessary to assume that the ect was disspelled by heating, as boiling for five nutes caused the bile to give an indirect reaction. If the former, it was necessary to assume that chemical treatment leading to the crystallization of bilirubin from bile had converted it to the indirect reacting type as the same crystals were obtained, albeit by different methods, from indirect reacting serum on the one hand and from bile or prompt direct reacting serum on the other. In this connection it should perhaps be emphasized that a different method was necessary in the latter case because of the ease of oxidation of the prompt direct reacting bilirubin. The reason for this is not yet clear, but it constitutes one of the well-established differences between the two forms. It may well be related fundamentally to the greater water solubility of the prompt direct type and the correspondingly greater solubility in chloroform of the indirect type. In addition to these differences the two forms have been found to differ significantly in their absorption spectra.[41] There has been general confirmation that crystalline bilirubin isolated from cattle gallstones or bile, or as more recently obtained in this laboratory from human feces,[51] is identical with the crystalline bilirubin formed in old hemorrhages, as initially described by Virchow. Here the most decisive link was the crystallographic study of Fischer and Reindel,[13] as already mentioned. This clearly established the identity of the two forms. Since their source of extravasated blood was an echinococcus cyst of the liver the bare possibility had to be considered that the bilirubin was in some way derived from liver bile and not from the extravasated hemoglobin. Rich and Bumstead[42] later identified the crystalline bilirubin isolated from a hemorrhagic mesenteric cyst with that obtained from cattle gallstones.

Despite a voluminous literature and many concepts as to the nature of the van den Bergh reaction, little advance has been made until very recently. The studies of Cole and Lathe[43,44] in England have provided concrete information of great value. Before considering these studies in more detail, it is perhaps desirable to comment briefly

---

The first E. T. Bell Lecture of the Minnesota hological Society.

rom the Department of Medicine, University of nnesota Medical School and Hospital, Minneapolis. e studies in this laboratory have been supported in t under contracts with the Surgeon General's Office, .A., and the Atomic Energy Commission. Presented part at the meeting of the Minnesota Pathological iety, October 18, 1955.

This lecture will appear in three installments, of which s is the second.

on the possibility that a different binding might explain the difference between the prompt direct and the indirect or delayed reaction. Various investigators had suggested that the indirect reaction was due to a combination of bilirubin with a serum protein, either albumin, globulin or globin. Of the three the latter was perhaps the most logical assumption, and that which was hitherto favored in this laboratory.[26a] The term "bilirubinglobin" was first suggested by Duesberg,[45] who believed that in the formation of bilirubin from hemoglobin and prior to the excretion of bilirubin by the liver cells, the bilirubin as first formed was still attached to globin. Fiessinger and co-workers[46] reported that a combination of bilirubin and globin, *in vitro,* gave an indirect reaction while bilirubin and albumin gave a direct reaction. Since it was well known from the work of Snapper and Bendien,[47] Pederson and Waldenström,[48] and Coolidge[49] that all the bilirubin in the serum, whether direct or indirect, traveled with the albumin fraction, either electrophoretically or in the ultracentrifuge, it would have been necessary to assume that if the indirect reacting form were actually a bilirubinglobin, the relatively small amount of globin involved would be masked by the larger amount of the serum albumin. The similar molecular weights and ultracentrifugal behavior made this theoretically feasible, also there was the possibility of a molecular complex between the small amount of globin and some fraction of the serum albumin. One of the main objections to this theory has already been mentioned—that free crystalline bilirubin gives an indirect reaction. This, however, did not exclude the possibility that the behavior of crystalline bilirubin with the diazo reagent is on a different basis than that of the indirect reacting bilirubin in serum.

The work of Cole and Lathe[43,44] fully confirms van den Bergh's observations and belief in the essential difference of the two types of reactions, but does not support the concept that the delayed or indirect type is bilirubinglobin. In brief, they were able to separate the direct and indirect reacting types by reverse phase chromatography, using silicone coated Kieselguhr. It was evident in their study that the direct type was polar in its behavior, that is relatively much more water soluble; the indirect type non-polar, or less water soluble. The indirect type obtained in this fashion was not associated with a protein. Its non-polar character is quite in accord with the earlier observations that
it is much more readily extracted by chlor
form;[40,50a] indeed, it is highly likely that all
the differences in behavior of the two types a
based on relative water solubility. Cole ar
Lathe[43,44] consider that the two direct or pol
types of pigment which they find in fresh bile ar
in blood serum from patients with regurgitatic
jaundice, differ chemically from the indirect typ
They regard the latter simply as free bilirubin ar
believe that the direct type is converted to th
indirect or to free bilirubin by various chemic
manipulations, to account for the fact that or
can isolate crystalline free bilirubin from bile, ga
stones or human feces.[51] As van den Bergh ar
Snapper showed years ago, crystalline bilirub
can also be isolated from direct diazo reacting h
man serum,[39] but this requires a somewhat diffe
ent and more complicated procedure than is tr
with indirect reacting serum. Cole and Lathe
concept that the direct reacting bilirubin diffe
chemically from the indirect is in essential agre
ment with van den Bergh who believed that
chemical change occurred on heating the bile
during the extraction process in which crystallir
bilirubin is obtained from cattle gallstones, sinc
heating is employed in that process. While it h
not yet been proved that the indirect reacting bil
rubin of heated bile is identical with that of hem
lytic jaundice serum, or for that matter with th
crystalline bilirubin as isolated from any one of
variety of sources already referred to, it is reason
able to assume at least tentatively that they a
identical. On the basis of the conversion from d
rect to indirect by heating, van den Bergh, ar
others after him, considered that the direct typ
might represent a complex with one or more of th
bile acids, but adequate evidence for this has n
been obtained. Further study is needed with r
spect to possible complexing of bilirubin with son
naturally occurring metabolite, to explain th
prompt direct reaction, also the polar behavior ar
urinary excretion which is correlated with it.

It would lead too far afield to treat in any d
tail of the significance of the fractional serum bi
rubin in clinical medicine, but a few words m
be desirable. Although, due to lack of a sensiti
photometer, van den Bergh made no attempt
determine the different types of bilirubin quan
tatively, he clearly recognized that a prompt cha
acter was the most significant feature of the dire
reaction and that the delayed direct increment w
fundamentally related to the indirect type. O

o n experience over the years has been in full a ord with this concept. In cases of pure reten-t n jaundice, as for example, simple hemolytic j ndice or constitutional hepatic dysfunction ilbert's disease), the serum exhibits little or no mpt direct reaction. Often none whatever can observed with the naked eye, at least within first few minutes. On standing for a time, wever, a definite slowly developing "delayed ect" reaction usually appears. If alcohol is ded at any time during this period, all of the irubin reacts quickly in the characteristic in-ect reaction. The lack of direct reaction is n more striking in hemorrhagic serous effusions which local formation of bilirubin has occurred ig. 5). As van den Bergh emphasized, the mpt direct reaction of bile or serum of patients th regurgitation jaundice occurs within thirty onds to one minute. It was on this basis that cci and I first advocated measurement of the ect reaction at one minute.[50a] Study of the ne curves of the direct reaction of many differ-t samples of blood serum from various diseases licates that while the one minute measurement arbitrary, it serves well in separating the prompt from the delayed components. If one postpones measurement of the direct reacting bilirubin to thirty minutes, as in the Evelyn-Malloy method,[52] the distinction of pure retention jaundice, such as uncomplicated hemolytic jaundice or constitutional hepatic dysfunction of the Gilbert type, is not as clear. Thus in a case of chronic familial hemolytic jaundice the one-minute direct value was 0.3, the thirty-minute 1.8, the total (after alcohol) 4.8. There is every reason to believe that the thirty-minute value included a significant fraction of the non-polar or indirect type, which has reacted in a delayed direct fashion. It is quite possible that this is true also of a part of the one-minute fraction, but at least the proportion which reacted was so small that the contrast was striking and quite in accord with the lack of bilirubinuria and the concept of a pure retention jaundice.

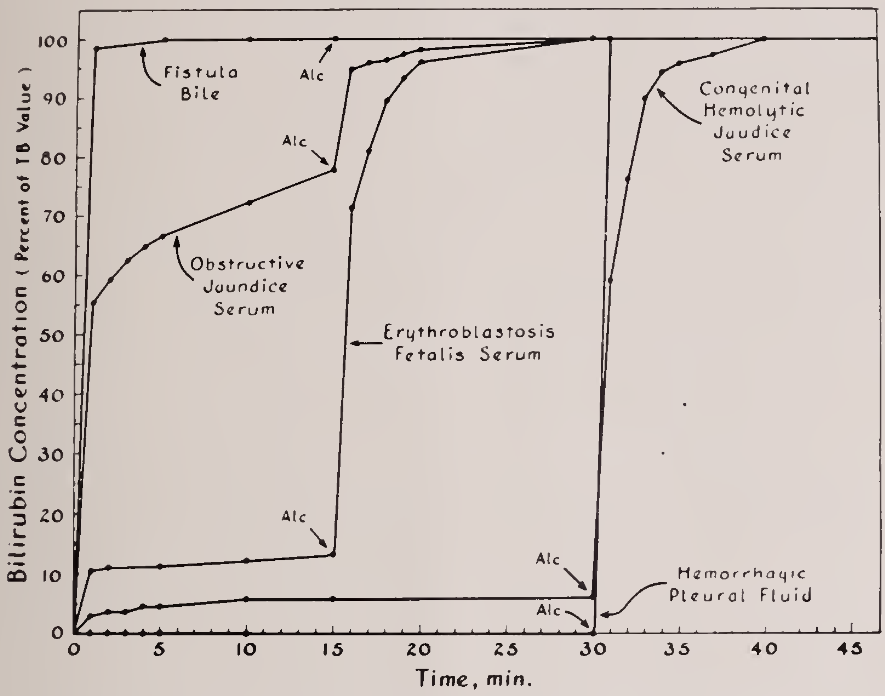


Fig. 5. Time curves of diazo reactions of various body fluids and jaundiced sera. (From Zieve, L., Hill, E., Hanson, M. L., Falcone, A. B., and Watson, C. J., *Journal of Laboratory and Clinical Medicine,* vol. 38, p. 446, 1951. Reproduced by permission of the publishers.)

For a time Ducci and I[50a] used a fifteen-minute measurement in addition to that at one minute, but this is believed unnecessary and experience has shown that one obtains the information of value from the one-minute determination and from the total following the use of alcohol, as in the regular Evelyn and Malloy modification[52] of van den

Bergh's method. It may be noted in passing that the essence of the Evelyn-Malloy modification was a primary dilution of the serum to a point where alcohol could be added without precipitation of the serum proteins. Van den Bergh had already recognized that some loss of bilirubin occurred on the precipitated protein, but his colorimetry was not sufficiently sensitive to permit a primary dilution of the serum. With the development of the Evelyn photoelectric colorimeter this became possible and constituted the valuable modification which Evelyn and Malloy proposed and which has come into general use.

In our hands and in many other clinics, measurement of the one-minute or prompt direct reacting fraction and of the total bilirubin and their ratio, has enhanced the value of the serum bilirubin determination. It is fully evident that if the determination is restricted to the total bilirubin as in some laboratories, information of value will often be quite neglected. In brief, the particular information that one can expect to obtain may be listed as follows:

1. Significant increase of the prompt direct fraction within a normal total. The latter has a rather wide range from .5 to 1.5 per 100 cc. A study with Zieve in this laboratory[53] revealed an upper limit of normal for the one-minute fraction of 0.25 mg. per 100 cc., most often less than 0.2. While the determination of the prompt direct or one-minute fraction is relatively inaccurate, it is quite adequate to distinguish normal and abnormal values, as shown in the study with Zieve. In many cases of infectious hepatitis, either in the preicteric stage or in instances in which jaundice never develops, the one-minute fraction may be found between .3 and .8 with a total value less than 1.5.

2. The smaller the proportion of prompt direct reacting bilirubin, the greater the preponderance of retention as versus regurgitation jaundice. This is represented in its purest form by uncomplicated hemolytic jaundice, or non-hemolytic, constitutional hepatocellular dysfunction. In the former the excess of serum bilirubin is presumably due to overloading, in other words, overproduction beyond the ability of the liver to excrete bilirubin, and in the latter to a constitutional sluggishness or specific disturbance of the liver cell in the excretion of bilirubin. In such instances the proportion of prompt direct reacting bilirubin is below 20 per cent. Such a finding at once indicates t presence of a retention jaundice and is of imm diate value in the primary classification of t problem. It should be mentioned that in rece years another type of constitutional hepatic d function has been described and has come to known as Dubin's disease.[45] The exact nature this disturbance is still not clear. The liver ce are filled with a dark brown pigment, as yet u identified. In this disease, however, regurgitati jaundice is characteristic and the percentage prompt direct reacting bilirubin is much larg usually from 50 to 70 per cent even at levels total bilirubin in the range of 3 to 6 mg. per ce The contrast between these two forms of cons tutional jaundice in itself offers decisive eviden of the value of the fractional serum bilirub determination.

3. In the presence of regurgitation jaundi with bilirubinuria, the finding of a relatively l percentage (20 to 40) of prompt direct reacti bilirubin, in our experience points strongly towa a diffuse hepatic disease with an associated hem lytic activity. This is seen in some cases of hepat cirrhosis and at times in subacute or chronic hep titis. It may be observed also in Hodgkin's disea or leukemia with hepatic involvement, splen megaly and jaundice, also hepatic carcinomatos

The fractional serum bilirubin determinati has gained a certain amount of undeserved repute because it commonly fails to differentia between the regurgitation jaundice due to diffu liver disease and that due to extrahepatic bilia obstruction, in other words between "medica and "surgical" regurgitation jaundice. This is d to the fact that in many of these cases the ove lapping of bilirubin ratios in the range from 40 70 per cent is too great to permit distinctio This is not surprising if one simply contemplat that in the hepatic types of regurgitation jaundi injury of the cholangiolar system within the liv is probably responsible for a return of bile to t blood and consequently for a relatively high pr portion of prompt direct reacting bilirubin. T concept is at least strongly supported by the m jority of available evidence. In our experience t cut-off point with respect to a reasonable accura in differential diagnosis, that is, in recognizi jaundice due to diffuse liver disease or retenti jaundice on the one hand as contrasted wi regurgitation jaundice due to obstruction, is abo

5 per cent. Below this figure one can be fairly ertain that one is not dealing with extrahepatic iliary obstruction. Values from 35 to 40 per cent re highly indicative, and from 40 to 45 per cent ore suggestive of parenchymal or parenchymal-emolytic jaundice, while above 45 per cent the rum bilirubin determination fails to be of disnguishing value. This is in general agreement ith Ducci's observations, in a large material.[50b]

Excretion and Fate of Bilirubin

There is general agreement that under normal ircumstances all of the bilirubin formed from emoglobin catabolism is excreted in the bile and he majority of evidence indicates that little or one of it is reabsorbed from the intestinal tract. here is only fragmentary data as to the normal mount of bilirubin in the twenty-four-hour bile of he human being. Perhaps the best data on this oint were obtained by Eppinger[22] in two patients ith complete external biliary fistulas, both being n relatively good condition at the time of the obrvation. The spectrophotometric method which as employed was at least reasonably accurate. he values obtained ranged from 300 to 370 mg. er day. These are of considerable interest when ontrasted with the lower values for fecal urobiliogen which will be discussed in a moment.

Many studies have shown that bilirubin is elatively unchanged until it reaches the cecum nd ascending colon where the major reduction o the urobilinogen group takes place. This will lso be considered in the following. First, however, t is desirable to comment briefly on the question f occurrence of bilirubin in the feces. It is well stablished that in the newborn period there is no eduction of bilirubin to the urobilinogen group, nd according to With,[23] urobilinogen and urobilin re not found during the first three weeks, after hich they steadily increase in amount so that fter a year in the normal individual bilirubin s not demonstrable by ordinary methods. Fischer nd Libowitzky[54] isolated crystalline bilirubin rom the feces in a case of hemolytic jaundice. T. Vith[23] concluded that except for great overloading, s in hemolytic jaundice, bilirubin does not occur n the feces of normal adult humans, although it nay appear in states of severe diarrhea. Studies n this laboratory with Sborov and Jay[55] clearly evealed that aureomycin and other broad specrum antibiotics at least temporarily interfere with eduction of bilirubin in the colon with the result that it appears in considerable amount in the feces. By taking advantage of this observation and a new method of isolation, Lowry and the author were able to obtain relatively large amounts of crystalline bilirubin from the feces of human cases of hemolytic jaundice.[51] This has an important bearing on the urobilinogen problem and will be considered again in the following. Recent studies with Dr. Malcolm Campbell and Miss Hawkinson† have shown that bilirubin (and/or mesobilirubin) is regularly present in normal human feces in small amounts ranging from 5 to 20 mg. per day. The values in patients with hemolytic jaundice are considerably higher, as might be expected. From this it is evident that any study of total, hemoglobin derived pigment excretion must include bilirubin as well as its derivatives, which will now be discussed.

Urobilin and Urobilinogen Group

The term group is used advisedly because it has become increasingly clear that at least three compounds contribute in varying measure to the reactions which have been used in the past to characterize urobilin and urobilinogen. It will be evident in the following brief historical survey that the terms urobilin and urobilinogen are best suited to the designation of the *group*. From the time of the discovery of urobilin in 1868[56] until the crystallization of mesobilirubinogen by Hans Fischer in 1911,[57] information as to the nature of urobilin and urobilinogen was very vague indeed and in fact it was not until the isolation of crystalline stercobilin in 1931[67] and its subsequent comparison with the urobilin obtained from crystalline mesobilirubinogen, that the existence of at least two members of the urobilin group was clearly established. It will not be necessary here to review the literature of the development of our knowledge of this group in any detail. The older literature was admirably brought together by Meyer Betz in 1913.[58] In the author's Harvey lecture in 1948[59] an attempt was made to consider the more important work of the intervening years. Torben With's monograph on the bile pigments published in 1954[23] presents an extensive discussion of the literature. It may be helpful now to bring together in tabular form some of the more significant mileposts of progress in this long history.

---

†To be published.

Discovery of urobilin in urine and bile—Jaffé—1868.[56]

Identification of similar compound from feces, named stercobilin—Van Lair and Masius—1871.[60]

Amalgam reduction of bilirubin *in vitro* with resultant formation of urobilin type compound ("hydrobilirubin"); recognition that bacteria can similarly reduce bilirubin. Concept of enterogenous nature of urobilin—Maly—1871-2.[61a,b]

The enterogenous concept strongly supported. Transitory appearance of urobilin in feces and urine of case with complete biliary obstruction, upon feeding of urobilin free swine bile—F. v. Müller.[62a,b]

Clear recognition and naming of the chromogen urobilinogen—LeNobel—1887.[63]

The finding of a positive aldehyde reaction in the urines of many cases of liver disease—Paul Ehrlich—1901.[64]

Recognition that the aldehyde reacting substance of Ehrlich is urobilinogen—Neubauer—1903.[65]

Isolation of crystalline mesobilirubinogen after amalgam reduction of bilirubin—Hans Fischer—1911.[57]

Isolation of a crystalline urobilinogen from human urine; identification with crystalline mesobilirubinogen—Fischer and Meyer Betz—1911.[66]

Synthesis of mesobilirubinogen—Fischer and Adler.[66a]

Isolation of crystalline stercobilin from feces and urine—Watson—1931-33.[67,68,69,70]

Amalgam reduction of stercobilin yields a chromogen differing from mesobilirubinogen—Watson—1932.[68,69]

Isolation of crystalline urobilin IX.a* following oxidation of mesobilirubinogen *in vitro;* distinction of this urobilin from the stercobilin isolated from the feces and urine—Watson—1934[71]; Lemberg—1935.[72]

Synthesis of urobilin IX,a*—Sedel and Meier—1936.[71a]

Stercobilin strongly levorotatory, urobilin from mesobilirubinogen optically inactive—Fischer, Halbach and Stern—1935.[73]

Isolation of a dextrorotatory or d-urobilin from infected fistula bile—Schwartz and Watson—1942.[74]

Isolation of d-urobilin from feces of patients receiving broad spectrum antibiotics—Sborov, Jay and Watson—1949.[55]

Conversion of mesobilirubinogen to stercobilin—Watson, Sborov, and Schwartz—1942.[75]

Conversion of N_{15} labeled mesobilirubinogen to stercobilin—Lowry and Watson—1954.[76]

Isolation of crystalline d-urobilinogen and mesobilirubinogen from human feces—d-urobilinogen isomeric with dihydromesobilirubin—Lowry and Watson—1955.[77]

Conversion of d-urobilinogen to mesobilirubinogen by amalgam reduction—Lowry and Watson—1955.[77]

It is simple and logical to designate the three members of the urobilin group on the basis of their remarkably differing optical activity: d-urobilin $([\alpha]^{d}_{20^\circ} + 5000)$, i-urobilin (inactive), and l-urobilin or stercobilin $([\alpha]^{d}_{20^\circ} - 4000)$. The latter is readily distinguished from the i- and d-forms by the Lemberg ferric chloride test,[78] which is a modification of Fischer and Niemann's method[79] of preparing mesobiliviolin from mesobilirubinogen. With the Lemberg test d-urobilin usually exhibits a green-blue or aqua color, i-urobilin blue or blue violet while l-urobilin is brownish yellow or at most slightly pink. The spectral characteristics of the final colored solutions are very helpful in distinguishing mixtures. Newer methods of crystallizing the urobilins, applicable to microgram quantities, have recently been described.[80,81] Also a new and relatively simple method permits preparation of i-urobilin from bilirubin, over mesobilirubinogen, but without concentration or crystallization of the latter compound.[80]

The exact role of d-urobilinogen in the normal pathway of reduction of bilirubin to stercobilinogen is not yet clear, but the above-mentioned study with Lowry[77] indicated the possibility that it may be a normal intermediary ordinarily reduced further by the normal intestinal flora. In occasional instances d-urobilin has been demonstrated in either feces or urine in which there was no history of the use of broad spectrum antibiotics or where these had not been used for a long period. In respect to the latter, however, an effect of long but variable duration must be recognized, and the possibility must also be considered that d-urobilinogen is formed only in the presence of an abnormal bacterial flora. Further work on this question is in progress.

It will be noted that the above survey takes cognizance of but one, the enterogenous concept of urobilinogen group formation. This has been widely accepted; indeed it appears incontrovertible on the basis of a great many studies, including those of Friedrich Müller, McMaster and associates and many others as set forth in the above-mentioned reviews by Meyer Betz,[58] Watson[59] and With.[23] In these a discussion is also found of other concepts, notably the hepatogenous and the histogenous. In recent years, Baumgärtel of Munich has dvanced a dichotomous concept which has reeived considerable attention, especially in urope, and therefore requires some discussion. his concept has not been included in the above urvey, because as will be evident in the following, is in serious conflict with many other well stablished facts and in the author's opinion it is ot borne out by other significant observations, oth prior and more recent.

---

*IX,a simply designates a configuration corresponding to protoporphyrin IX of hemoglobin, the porphyrin ring opening at the a or α methene bridge to form bile pigment. Many other urobilin isomers are theoretically possible and a few have been synthesized, but none other than IX.a have been found in nature. IX,a applies as well to the l- and d-urobilins and should not, therefore, be considered to distinguish the i-form.

According to Baumgärtel,[82,83,84] mesobilirubinoen is made only in the liver, or more properly y an enzyme in stagnant hepatic bile; sterobilinogen, only by bacterial activity in the feces. aumgärtel has often asserted that mesobiliubinogen is not and cannot be converted to sterobilinogen, this despite the earlier studies in this aboratory as mentioned in the above survey as vell as the more recent study with Lowry, in vhich it was clearly shown that mesobilirubinogen s converted by bacterial activity to stercobilin.[75,76] ccording to Baumgärtel and his followers, otably Stich[37,85] and Rudolph,[87] the optimum ondition for mesobilirubinogen formation by the iver is a liver injury with associated stasis of bile. The characteristic absence of urobilinogen in urine nd feces in the presence of complete biliary obtruction, or severe liver injury with complete uppression of bile flow, is explained by Baumärtel as a "block" of the necessary enzyme. He peculates that when the serum bilirubin level is ufficiently elevated for the given individual this utomatically turns off the hepatic dehydrogenase ctivity which is necessary to the formation of nesobilirubinogen.

However, this completely disregards the earlier ailure of Elman and McMaster[88] to find any uroilinogen formation in their dogs with total bile istula, in the absence of biliary obstruction, even n the presence of varying types and degrees of iver injury, nor does it take into account the triking exenteration experiments of Heilmeier and o-workers.[89] In these, the total removal of the ntestine in dogs was followed by a complete disppearance of urobilin from the urine and there vas no reappearance even when laked blood or emin were injected parenterally, although in control animals such an injection was regularly followed by increase of urobilin in the feces and urine. Although Baumgärtel considered these experiments, it is difficult to understand on what basis he drew the conclusion that they prove his thesis, that of the hepatogenous origin of mesobilirubinogen.

Billi and Heilmeier[89] observed that urobilin and *indican* reappeared in the urine of these exenterated animals nine or ten days after operation, but only following obvious onset of putrefaction in the stomach and duodenal blind loop. Baumgärtel interprets the reappearance of urobilin in the urine at this time as due to an enzymatic formation of mesobilirubinogen in the stagnant bile, but this scarcely explains the simultaneous reappearance of indican and of both urobilin and indican in the vomitus, clearly related, as Billi and Heilmeier emphasized, to bacterial putrefaction. More recently, W. C. Meyer[86] studied a case of small intestinal fistula in which it was noteworthy that members of the urobilin and urobilinogen group were entirely lacking from feces, small intestinal contents of the fistula, and bile obtained by duodenal drainage. Baumgärtel has stated repeatedly that sterile "liver brei" is capable of converting bilirubin to mesobilirubinogen *in vitro*. We have not been able to confirm this using either sterile rat liver or surviving rat liver excreting a relatively normal bile for eight to twelve hours.‡ Nevertheless it is conceivable that under certain peculiar conditions some reduction might take place even in the absence of bacteria. This would scarcely prove that the liver was the only or even the more important site of mesobilirubinogen formation *in vivo*.

Recent studies in this laboratory with Graham, Ziegler and Lowry,[90] revealing that bacteria readily carry out the transformation of d-urobilinogen to mesobilirubinogen and thence to stercobilinogen, together with the transitory disappearance of all three following aureomycin or terramycin therapy and their reappearance with time, in the order given, would be most difficult to reconcile with any but an enterogenous concept. Baumgärtel[91] has objected to the aureomycin studies on the speculation that aureomycin damages the liver and interferes with the enzymatic formation of mesobilirubinogen. The later report of Gohr and co-workers[92] was of interest in this connection. They found that urobilinuria (not stercobilin) persisted in cases of liver disease receiving aureomycin. The significance of d-urobilin was not considered, nor have Baumgärtel or other proponents of his concept included it in their considerations.

---

‡Unpublished observations with S. Schwartz, G. Price and M. Campbell.

In our experience aureomycin or terramycin regularly produces a transitory disappearance of the urobilinogen group from the urine; and when it reappears, it is represented by the d- form, which, as already mentioned, is readily formed by the action of at least certain fecal bacteria on bilirubin, and is readily converted by bacterial or other reduction to mesobilirubinogen. It would not be surprising, however, if i-urobilin were to be found at some stage in such cases; indeed it would be anticipated on the basis of our recent observation that after discontinuance of aureomycin the feces for a time contains d-urobilin, later i-urobilin, and still later l-urobilin, or stercobilin. This observed sequence in itself is of the greatest significance with respect to the enterogenous source of all three. Baumgärtel and Zahn[91] stated that when large amounts of dihydrostreptomycin were given orally in a patient with cirrhosis of the liver excreting considerable amounts of urobilinogen in the urine, the feces became negative for urobilin or urobilinogen, while the urine remained positive. This was interpreted as a cessation of the bacterial formation of stercobilinogen with continued hepatic formation of mesobilirubinogen. Lowry and I* were unable to confirm this, as in our experiment dihydrostreptomycin in the same amount used by Baumgärtel and Zahn failed to affect the fecal flora sufficiently to cause disappearance of the urobilin group from the feces. This failure, indeed, was to have been expected on the basis of many other studies of the *in vivo* effect of various antibiotics on the fecal flora.

Bingold and Stich[86] have recently reviewed studies of the past few years which have sought to determine whether Baumgärtel's concept is supported by clinical observations of the relative amounts of i- and l-urobilin (stercobilin) in various disease states. Basing their conclusion mainly on the earlier studies of Stich[83] in which the pentdyopent and mesobiliviolin reactions were used, and on the subsequent findings of several other investigators using the latter of these two tests, they state that under normal circumstances and in states of increased hemolytic activity, also in pernicious anemia, stercobilinuria is characteristic, while in liver disease i-urobilin usually predominates, although they observed a mixture with stercobilin in some instances. They agree with Baumgärtel that when there is complete disappearance of the urobilinogen group from the urine in cases of severe parenchymal jaundice as typified by infectious hepatitis, the controlling factor is the blood bilirubin level. As this rises, it is conceived that the cellular fermentative conversion of bilirubin to urobilinogen in the damaged liver cell is increasingly depressed to the point where it disappears entirely. Interestingly enough, they observed stercobilinuria during the receding phase of jaundice in these cases, and failed to explain why, with the obvious persistence of liver functional impairment at this stage, they did not find i-urobilin.

Stich[85] claims that urobilinogen is often demonstrable in the urine and feces in patients with complete mechanical biliary obstruction. In our previous studies of this aspect of the urobilinogen problem, complete biliary obstruction, as most often due to cancer of the pancreas or biliary tract is characterized by the presence of less than 5 mg. of urobilinogen per day in the feces, and less than 0.3 mg. in the twenty-four-hour urine. Based on earlier work, it has generally been thought that these trace amounts were derived from bilirubin liberated from colonic epithelial cells swept off by the feces, and that this bilirubin was then reduced in the usual fashion to the urobilinogen group. Stich, however, claims that in this situation only mesobilirubinogen or i-urobilin is represented, and he believes that the traces in the urine were formed in the stagnant bile above the obstruction, those in the feces, by the action on bilirubin of cellular enzymes in the intestinal epithelium. He apparently did not consider the possibility that bacterial reduction of bilirubin might progress only as far as d- or i- urobilin and not to the l-form (stercobilin) under the influence of the abnormal environment of bile exclusion. Some indication of this was found in this laboratory a number of years ago[75] in the observation that stercobilin was not formed from mesobilirubinogen (i-urobilinogen) *in vitro* on the addition of acholic feces, but was observed with normal feces.

Within the past two years studies have been carried out in this laboratory with respect to the relative amounts of i-, d- and l- urobilins in the urine in various types of disease, notably hemolytic states and liver disease. These have failed to support the view of Baumgärtel, Stich and others that there is a relatively strict separation between iese two general groups insofar as the proportion r i- and d- urobilin on the one hand, and l- robilin on the other, is concerned. In brief, the rystalline material and the mother liquor were xamined from both urine and feces in these cases nd no consistent pattern was observed. In the epatic cases just as much stercobilin was found s in those with hemolytic states, and vice versa ith respect to i- and d-urobilin. The results of iis study will be reported in detail elsewhere. hese observations, together with the clear evience that mesobilirubinogen is converted to ercobilinogen by the fecal flora and that the fecal ora under various circumstances convert biliibin either to d-, i- or l-urobilin, also that mesoilirubinogen (i-urobilinogen) regularly occurs in ie feces, strongly indicate that if the liver parcipates in urobilinogen formation, it must be to very minor and unimportant extent and that in eneral the intestinal origin of the urobilinogen roup is by far the most significant.

---

*Unpublished observations.

Addendum

Very recently R. Schmid* has found that the prompt irect bilirubin of bile and of the serum and urine i cases of regurgitation jaundice, is a glucuronide. illing and Lathe** have independently obtained evience that this is the state of the bile bilirubin. These bservations go far in clarifying the nature of the difering van den Bergh reactions.

References

39. Hijmans van den Bergh, A. A.: Der Gallenfarbstoff im Blute. Leipzig: Barth; Leiden: van Doesburgh, 1918 and 1928.
40. Grunenberg, K.: Über die Differenzierung des Serumbilirubins durch seine Chloroformlöslichkeit. Ztschr. f. d. ges. exper. Med., 31:119, 1923.
41. Davis, G. E., and Sheard, C.: The spectrometric investigation and determination of bilirubin. J. Lab. & Clin. Med., 19:593, 1934.
42. Rich, A. R., and Bumstead, J. H.: On the identity of haematoidin and bilirubin. Bull. Johns Hopkins Hosp., 36:225, 1925.
43. Cole, P. G., and Lathe, G. H.: Separation of serum pigments giving the direct and indirect van den Bergh reaction. J. Clin. Path., 6:99, 1953.
44. Cole, P. G., and Lathe, G. H.: Separation of the bile pigments of serum, bile and urine. Biochem. J., 57:514, 1954.
45. Dubin, I. N., and Johnson, F. B.: Chronic idiopathic jaundice with unidentified pigment in liver cells (a new clinico-pathologic entity with a report of twelve cases). Medicine, 33:155, 1954.
46. (a) Fiessinger, N.; Gajdos, A., and Polonovski, M.: Le role de la globine dans la reaction indirecte de diazotation de la bilirubine. Compt. rend. Soc. biol., 135:1572, 1941. (b) Fiessinger et al: Sur la bilirubinglobine et la globine libre du plasma sanguine. Compt. rend. Soc. biol., 136:714, 1942.
47. Snapper, I., and Bendien, W. M.: On the physicochemical condition of bilirubin in the blood serum and urine. Acta med. scandinav., 98:77, 1938.
48. Pedersen, K. O., and Waldenström, J.: Studien über das Bilirubin in Blut und Galle mit Hilfe von Elektrophorese und Ultrazentrifugierung. Ztschr. f. physiol. Chem., 245:152, 1937.
49. Coolidge, T. B.: Chemistry of the van den Bergh reaction. J. Biol. Chem., 132:119, 1940.
50. (a) Ducci, H., and Watson, C. J.: The quantitative determination of the serum bilirubin with special reference to the prompt-reacting and the chloroform soluble types. J. Lab. & Clin. Med., 30:293, 1945. (b) Ducci, H., and Roeschmann, W.: Bilirubinemia directa pronta y su importancia. Clin. Rev. Med. de Chile, 77:192, 1949.
51. Lowry, P. T.; Bossenmaier, I., and Watson, C. J.: A method for the isolation of bilirubin from feces. J. Biol. Chem., 202:305, 1953.
52. Malloy, H. T., and Evelyn, K. A.: Determination of bilirubin with the photoelectric colorimeter. J. Biol. Chem., 119:480, 1937.
53. Zieve, L.; Hill, E.; Hanson, M.; Falcone, A. B., and Watson, C. J.: Normal and abnormal variations and clinical significance of the one-minute and total serum bilirubin determinations. J. Lab. & Clin. Med., 38:446, 1951.
54. Fischer, H., and Libowitzky, H.: Zur Kenntnis des Stercobilins. Ztschr. f. physiol. Chem., 258: 255, 1939.
55. Sborov, V.; Jay, A. R., and Watson, C. J.: The effect of aureomycin on urobilinogen formation and the fecal flora. J. Lab. and Clin. Med., 37: 52, 1951.
56. (a) Jaffe, M.: Beitrag zur Kenntnis der Gallen- und Harn Pigmente. Centralbl. f. d. med. Wissensch., 6:24, 1868. (b) Jaffe, M.: Uber die Fluorescenz des Harnfarbstoffs. Centralbl. f. d. med. Wissensch., 7:177, 1869.
57. Fischer, H.: Zur Kenntnis der Gallenfarbstoffe. I. Mitteilung Ztschr. f. physiol. Chem., 73:204, 1911.
58. Meyer-Betz, F.: Die Lehre vom Urobilin. Ergeb. d. inn. Med., u. Kinderh., 21:733, 1913.
59. Watson, C. J.: Urobilin and stercobilin. The Harvey Lectures Series, XLIV, p. 41. Springfield, Ill.: Charles C Thomas, 1948-1949.
60. Van Lair, C. F., and Masius, J. B.: Über einen neuen Abkommling des Gallenfarbstoffes in Darminhalt. Centralbl. f. d. med. Wissensch., 9:369, 1871.
61. (a) Maly, R.: Kunstliche Umwandlung von Bilirubin in Harnfarbstoff. Ann. d. chem., 161: 368, 1871. (b) Maly, R.: Untersuchungen über die Gallenfarbstoffe. III. Abhandlung. Umwandlung von Bilirubin in Harnfarbstoff. Ann. J. Chem., 163:77, 1872.
62. (a) v. Müller, F.: Untersuchungen über Ikterus. Ztschr. f. klin. Med., 12:45, 1887. (b) v. Müller, F.: Über Ikterus. Verhandl. d. schles. Gesellsch. f. vaterland, Kultur. p. 1. 1892.
63. Le Nobel C.: Über die Einwirkung von Reductionsmitteln auf Haematin und das Vorkommen der Reductions-producte in pathologischem Harne. Pflüger's Arch., 40:501, 1887.
64. Ehrlich, P.: Über die Dimethylamidobenzaldehydreaktion. Med. woche, 2:115, 1901.
65. Neubauer, O.: Bedeutung der Ehrlichschen Farbenreaktion. München. med. wchnschr., 50:1846, 1903.
66. (a) Fischer, H., and Meyer-Betz, F.: Zur Kenntnis der Gallenfarbstoffe: II. Über das Urobilinogen des Urins und das Wesen der Ehrlichschen Aldehydreaktion. Ztschr. f. physiol. Chem., 75:232,

---

*Science (in press).

**Biochem. J. (in press).

1911. (b) Fischer, H., and Adler, E.: Synthese des Mesobilirubinogens und der Mesobilirubinsaure, ines Mesobilirubins und einer neoxanthobilirubinsaure sowie von (1,8)-dioxy-tripyrrodi-enen. Ztschr., 200:209, 1931.
67. Watson, C. J.: Über Stercobilin und Porphyrine aus Kot. Ztschr., 204:57, 1932.
68. Watson, C. J.: Über Stercobilin, Kopromesobiliviolin, und Kopronigrin. Ztschr., 208:101, 1932.
69. Watson, C. J.: Isolation of crystalline urobilin from human urine. Proc. Soc. Exper. Biol. & Med., 30:1210, 1933.
70. Watson, C. J.: Über krystallisiertes Stercobilin bzw. Urobilin. IV Mitt. Ztschr. f. physiol. Chem., 233:39, 1935.
71. (a) Watson, C. J.: The origin of natural crystalline urobilin (stercobilin). J. Biol. Chem., 114:47, 1936. (b) Siedel, W., and Meier, E.: Synthese des Urobilins (Urobilin-IX.a) sowie der isomeren Urobiline-III, und—XIII. Ztschr. f. physiol. Chem., 242:101, 1936.
72. Lemberg, R.: Urobilinogen. Nature, 134:422, 1934.
73. Fischer, H.; Halbach, H., and Stern, A.: Über Stercobilin und seine optische Aktivität. Ann. d. Chem., 519:254, 1935.
74. Schwartz, S., and Watson, C. J.: Isolation of a dextrorotatory urobilin from human fistula bile. Proc. Soc. Exper. Biol. & Med., 49:643, 1942.
75. Watson, C. J.; Sborov, V., and Schwartz, S.: Formation of (laevorotatory) stercobilin from mesobilirubinogen in human feces. Proc. Soc. Exper. Biol. & Med., 49:647, 1942.
76. Lowry, P. T.; Ziegler, N. R.; Cardinal R., and Watson, C. J.: The conversion of N_{15} labeled mesobilirubinogen to stercobilinogen by fecal bacteria. J. Biol. Chem., 208:543, 1954.
77. (a) Lowry, P. T., and Watson, C. J.: The isolation of crystalline d-urobilinogen. J. Biol Chem. 218:641, 1956. (b) Watson, C. J., and Lowry, P. T.: A further study of crystalline d-urobilin. J. Biol. Chem., 218:633. 1956.
78. Lemberg, R.; Lockwood, W. H., and Wyndham, R. A.: Urobilins and urobilinogens. Australian J. Exper. Biol. Med. Sc., 16:169, 1938.
79. Fischer, H., and Niemann, G.: Zur Kenntnis des Gallenfarbstoffes. VIII. Mitteil. Mesobiliviolin, Mesobiliviolinogen und die Kondensation von Mesobilirubinogen mit Aldehyden unter Bildung von neuen Spaltprodukten. Diazofarbstoff des Mesobilirubins. Ztschr. f. physiol. Chem., 137:292, 1924.
80. Watson, C. J.: The direct preparation of crystalline urobilin from bilirubin. J. Biol. Chem., 200:691, 1953.
81. Watson, C. J.; Lowry, P. T.; Sborov, V. E.; Hollinshead, W. N.; Kohan, S., and Orrego Matte, H.: A simple method of isolation of crystalline stercobilin or urobilin from feces. J. Biol. Chem., 200:697, 1953.
82. Baumgärtel, T.: Zur Kenntnis der biologischen Gallenfarbstoffreducktion. Ztschr. f. d. ges. exper. Med., 112:459, 1945.
83. Baumgärtel, T.: Physiologie und Pathologie des Bilirubinstoffwechsel's als Grundlagen der Ikterusforschung. Stuttgart: G. Thieme, 1950.
84. Baumgärtel, T.: Zur Kenntnis der enteral-bakteriellen Bilirubinreduktion. Deutsch. Arch. f. klin. Med., 197:138, 1950.
85. (a) Stich, W.: Sterkobilin als physiologischer Harnbestandteil. Dtsch. med. wchnschr., 71:137, 1946. (b) Stich, W.: Klinische Untersuchungen zur Unterscheidung von Sterkobilin und Urobilin mit der Pentdyopentreaktion. Klin. wchnschr., 26:365, 1948.
86. Meyer, W. C.: Untersuchungen über das Schicksal des Gallenfarbstoffes in menschlichen Organismus. Der Urobilin körperstoffwechsel IV. Arztliche Forschung Heft, 415:85, 1947.
87. Rudolph, H.: Chemie und Klinik der Bilirubinreduktions-produkte Urobilin und Sterkobilin. Leipzig: G. Thieme, 1952.
88. Elman, R., and McMaster, P. D.: Studies on urobilin physiology and pathology. IV. Urobilin and the damaged liver. J. Exper. Med., 42:99, 1925.
89. Billi, A.; Heilmeyer, L., and Pfotenhauer, F.: Harnfarbstoffausscheidung und Darmfäulnis. II. Mitteilung. Urobilin-, Urochrom-und Indicanausscheidung am exenterierten Tier. Ztschr. f. d. ges. exper. Med., 91:720, 1933.
90. Watson, C. J.; Graham, A.; Ziegler, N., and Lowry, P. T.: The intestinal formation and interrelationship of members of the urobilinogen group with special reference to the dextrorotatory form. Tr. A. Am. Phys., 67:242, 1954.
91. Baumgärtel, T., and Zahn, D.: Über die Urobilinogenurie des Parenchymikterus bei antibiotisch entkeimten Darmkanal. Münch. med. wchnschr., 94:337, 1952.

TRANSITIONAL HYDATIDIFORM MOLE

(Continued from Page 402)

cidence of toxemia in molar pregnancies is considerably greater than that of all pregnancies in general.

References

1. Beltz, R. V., and Hutchins, C. L. A.: A co-existing hydatidiform mole with living child and placenta previa. Ohio M. J., 47:832 (Sept.) 1951.
2. Berry, L. R., Swerdlow, M. A., and Edwards, A.: Transitional hydatidiform mole associated with extensive hydatid degeneration of the placenta and well-developed fetus. Am. J. Obst. & Gynec., 69:912, 1955.
3. Bowles, H. E.: Extensive hydatidiform mole formation with living child. Am. J. Obst. & Gynec., 46:154, 1943.
4. Chesley, L. C., Cosgrove, S. A., and Preece, J.: Hydatidiform mole with especial reference to recurrence and associated eclampsia. Am. J. Obst. & Gynec., 52:31, 1946.
5. Cline, A.: Hydatidiform degeneration of placenta, complete with fetus. Am. J. Obst. & Gynec., 51:132, 1946.
6. Eastman, N. J.: Revision of Williams' Obstetrics 10th edition, p. 644. New York: Appleton Century Crofts, Inc.
7. Hertig, A. T. and Edmonds, H. W.: Genesis of hydatidiform mole. Arch. Path., 30:260, 1940.
8. Melody, G.: Hydatidiform mole with severe preeclampsia. Am. J. Obst. & Gynec., 51:901, 1946.
9. Mueller, C. W.: Partial hydatidiform mole with a living child. New York State J. Med., 50:1279 (May) 1950.
10. Novak, Emil: Gynecological and Obstetrical Pathology. 2nd edition, p. 487. Philadelphia and London: W. B. Saunders Co., 1947.

Continuation Studies

HE DIAGNOSTIC USEFULNESS OF PERITONEOSCOPY

JAMES B. CAREY, JR., M.D.
Minneapolis, Minnesota

Peritoneoscopy is a simple and convenient ethod of examining the peritoneal cavity and as proved to be a very helpful procedure in roperly selected diagnostic problems.

Peritoneoscopy was originally done with cysto-opes which Kelling used to first demonstrate the echnique at Hamburg, Germany, in 1901.[1] Since hen the procedure has gradually gained populary, particularly since 1934 when Ruddock introuced an improved peritoneoscope which is most enerally used in this country today.[2,3,4]

In addition to inspection, a number of other rocedures may be performed which greatly inrease the usefulness of peritoneoscopy. Among hese are biopsy, either by means of a special foreps through the peritoneoscope or with a liver iopsy needle separately introduced through the bdominal wall and guided to the desired area ith peritoneoscopic vision.[5,6] Techniques for eritoneoscopic cholangiography[7,8] and measuring iliary pressures[9] have been described. Splenoortography has also been done under direct eritoneoscopic control.[10]

Indications

The chief indications for peritoneoscopy are nexplained ascites, liver disease and epigastric nasses. Suspected carcinoma of the gallbladder r tuberculous peritonitis are less common but qually good indications. Since intravenous holangiography still requires reasonably good liver unction, it will fail with jaundiced patients in hom cholangiolitic hepatitis or biliary cirrhosis annot be distinguished from surgically correctable iliary obstruction, and in such instances perioneoscopic cholangiography has proved very useul. Lesions of the female pelvic organs are exmined better by culdoscopy.[11]

The Procedure

The actual technique of peritoneoscopy is simple, being only slightly more involved than the ordinary paracentesis. Preoperative measures should include bleeding, clotting and prothrombin times and 1 liter of blood typed and cross matched. A simple brief explanation of the purpose and nature of the examination is usually sufficient to obtain the consent and confidence of the patient. Preoperative medication depends upon the patient's condition; most will tolerate 75 to 100 mg. of demerol, but this is not used in patients having severely impaired liver function. Since many candidates have liver disease, barbiturates are seldom used.

The patient's abdomen is prepared with ether, tincture of zephiran and sterile drapes. The point of entry is selected usually lateral to, or just below, the umbilicus and infiltrated with 1 per cent xylocain down to the peritoneum. A small incision, about 0.5 inch, is made through which a trocar is introduced and a tense pneumoperitoneum established with carbon dioxide. The trocar is then replaced by a larger cannula which carries the peritoneoscope.

Structures seen include the anterior abdominal wall, lower portions of the liver, fundus of the gallbladder, lower pole of the spleen (if enlarged), anterior wall and lesser curvature of the stomach, omentum, loops of bowel, parts of the female genitalia and dome of the urinary bladder. Examination of the upper abdomen is facilitated by the Fowler position and that of the pelvic cavity by the Trendelenburg position.

If a biopsy is desired a special forceps with its own lens and lighting system is put through the cannula in place of the examining scope. These forceps will remove a piece of tissue slightly less than a cubic centimeter in size from the surface of the liver. In some instances, when a deeper specimen of liver is desired, a liver biopsy needle is introduced through the abdominal wall and its

---

Presented at the Continuation Course in Gastronterology, University of Minnesota, Minneapolis, Deember 2, 1955.

From the Department of Internal Medicine, Univerity of Minnesota Medical School.

tip, which is easily seen as it pierces the parietal peritoneum, is directed to the area desired for biopsy. A biopsy improves the accuracy of the diagnosis and is attempted whenever possible.

If the gall bladder can be seen, cholangiograms are easily obtained by introducing a 6-inch No. 20 needle through the abdominal wall overlying the gall bladder and then, under peritoneoscopic vision, piercing the bladder wall. Bile is aspirated and 5 to 25 cc. of 35 per cent diodrast injected. The needle is withdrawn and roentgenograms obtained at intervals to follow the course of the contrast material. Dehydrocholic acid, nitroglycerin or both may be given to facilitate passage of the diodrast into the duodenum.

When the procedure is completed, the CO_2 is expelled and the incision closed with a skin clip. The time required for inspection and biopsy is usually ten to fifteen minutes, an additional five to ten minutes is required for injecting the gall bladder. When the patient is returned to the ward he may be up and about and eat as desired. If a biopsy has been done he is required to stay in bed at least twenty-four hours during which hourly blood pressures and pulse are recorded. Postoperative analgesics are not needed but the patient is told about moderate shoulder strap pain which may result from air under the diaphragm and is no cause for alarm.

Contraindications

Abdominal distention from intestinal obstruction is an absolute contraindication to peritoneoscopy. An adequate pneumoperitoneum cannot be established and the danger of bowel perforation is prohibitive. The acute abdomen is also a contraindication. The rigid abdominal wall frequently prevents a sufficient pneumoperitoneum and the danger of spreading possible infection is too great. The patient's general condition is sometimes a contraindication such as the severely debilitated elderly subject with diminished vital capacity or advanced terminal disease.

Liver biopsies cannot be obtained if the patient has a bleeding tendency including elevated prothrombin times not responding to Vitamin K. Greatly increased biliary pressure also precludes biopsy since the wound may continue to ooze bile for days causing bile peritonitis, fistulae or bleeding. Lesions in the retroperitoneal structures such as pancreas, aorta, kidneys or retroperitoneal nodes cannot be seen and peritoneoscopy in these conditions is of no value unless liver metastases are being sought.

Complications

Abdominal adhesions are the most frequent complication causing failure of peritoneoscopy because they prevent adequate visualization. Attempts to divide or break up such adhesions witl the scope invite the danger of intra-abdomina hemorrhage. Loops of bowel may be bound to th abdominal wall at the site of laparotomy scars anc consequently the peritoneoscope should never b inserted through or close to previous incisions Other occasional minor complications include subcutaneous emphysema localized about the incisio or a small ecchymosis in this area. Such condition are painless and disappear quickly. Bleeding fron a liver biopsy is, of course, another complicatio which must be carefully watched for by close observation of the patient and the frequent recording of the pulse and blood pressure for a period of a least twenty-four hours.

Discussion

Peritoneoscopy is not intended as a substitut for an exploratory laparotomy. Each has it specific indications which are in most instance mutually exclusive. Since peritoneoscopy is a simple, convenient and safe procedure to whic patients readily consent it is to be recommende when the proper indications, as discussed in th foregoing sections, are present.

Our experience has shown that the method ha been diagnostic in over two-thirds of the patient for whom it was requested because of a diagnosti problem and contributed helpful information in a additional one-fourth.[12] Others have reporte similar results.[13] Peritoneoscopy has been of particular value for patients in whom a prolonge prothrombin time precludes blind needle biops of the liver. In such patients, direct inspection the liver will usually confirm or exclude the suspected diagnosis. As new advances and unsuspec ed innovations are made in medicine peritoneoscopy may well continue to acquire new uses, a it has in the past with cholangiography, biliar manometric studies and splenoportography.

(Bibliography on Page 423)

urrent Concepts

MPHEDEMA

B. F. FULLER, M.D.
and H. W. JOHNSON, M.D.
Saint Paul, Minnesota

ymphedema is a relatively uncommon disease. Cnsequently, the practitioner of medicine does n have occasion to think of it often. In addition t this, the fact that lymphedema is a chronic and dfiguring disease which is refractory to treatment d s not enhance its position in the mind of the p sician. A third factor which tends to make us o rlook this phase of peripheral vascular disease i he insidious onset of certain inflammatory forms, t ir presence being masked by the acuity or erity of the primary illness until the fully dev oped syndrome of lymphedema is apparent, well e ablished, and oftentimes irreversible.

No attempt will be made to classify or to disc s all of the manifestations of lymphedema. We s ll concern ourselves only with lymphedema p ecox and with certain of the inflammatory f ms of lymphedema in this short discussion.

Lymphedema praecox is the most frequently s n form of non-inflammatory lymphedema. Alt ugh it is seen in both sexes, it is much more c nmon in the female. It usually has its onset s netime between late childhood and early adulth od and rarely begins before nine or after twentyf e years of age. This distinguishes it from the c ngenital forms of lymphedema (i.e. Milroy's dise e and simple congenital lymphedema). It is c aracterized by the gradual development of e ma of the affected member(usually unilateral) w ich may either be relentlessly progressive until t extremity is greatly deformed or which may s p its progression at any point. There is no p in except for the discomfort incident to the w ight of the enlarged extremity. The past medi l history is non-contributory and the family h tory is non-contributory. Although these pat nts may have infections of the feet secondary t the chronic edema, infection plays no role in t development of lymphedema praecox.

Physical examination reveals varying degrees of edema depending on the stage of the illness. It begins usually in the most distal part and extends proximally. In the early stages, the edema is usually soft and pits easily, but as the disease progresses and fibrosis occurs, the tissues become very firm. It should be emphasized, however, that lymphedema will pit even in the late stages if enough extracellular fluid is present. The appearance and texture of the skin are quite distinctive. It becomes coarse and indurated and has quite a different appearance from the skin of patients with long-standing venous stasis. Another important physical finding is that the venous pattern is normal in lymphedema praecox. Squaring of the toes has been described as a useful physical finding. In our experience, this has not occurred constantly enough in early cases to be helpful.

Other causes of venous and lymphatic obstruction, notably pelvic malignancy, must be carefully excluded by the physical examination.

The treatment of lymphedema praecox is discouraging. However, the earlier the diagnosis is established, the more satisfactory the results. Medical therapy has a twofold objective. First, the existing edema should be controlled and further edema formation prevented as completely as possible. This is accomplished by putting the patient to bed with the legs markedly elevated for three to seven days (until the leg is either back to normal size or until it stops receding in size) and then providing the affected extremity with an adequate elastic support. Weight reduction is also important in controlling the edema if the patient is obese. The second objective in medical therapy is control of fungus infection and acute cellulitis should they occur.

It should be emphasized at this point that neither of these objectives will be attained unless the attending physician enlists the wholehearted co-operation of the patient. In lymphedema, as in most chronic diseases, it is the patient who treats himself from day to day. He must make the decision every morning as to whether he will apply his heavy, hot rubber bandage, wash his feet and dry between the toes, and stay on his diet that day. He probably will not do these things faithfully unless the reasons for doing them are given to him clearly and simply and the alternatives are also made known to him.

Other than unwillingness on the part of the patient to co-operate, the most common cause of failure of medical treatment is failure to use adequate elastic support. This is defined as support that is heavy enough to control the edema completely. Usually a solid rubber bandage is ultimately required. This is admittedly distasteful to the patient, particularly the female patient. However, it is felt that the consequences of the illness are even more distasteful from the cosmetic viewpoint.

The surgical treatment of lymphedema consists of a plastic procedure designed to reduce the size of the limb and make it more useful. The procedure is difficult and must be done in two or three stages. A prolonged morbidity is common. Extensive scarring is the rule, and it must be understood by the patient that continued use of elastic support will be necessary postoperatively. It is a useful procedure when the need for it arises, but it is never done early in the illness or as a procedure to prevent progr sion.

Inflammatory forms of lymphedema are pro ably of more common occurrence than the no inflammatory forms. The two most commo seen forms in this area are those occurring conjunction with the trichophytosis and recurre superficial cellulitis in patients with long-standi chronic venous insufficiency and those occurri from the same causative factors in the absence chronic venous insufficiency. As was mention above, the lymphedema in this group is often ov looked in its incipiency because the chronica swollen leg, the recurrent acute cellulitis, cetera, tend to mask it. It develops very slow and does not become obviously apparent un the complete syndrome develops. This type lymphedema can be arrested at any stage if t causative factors can be controlled. The tre ment here is foot hygiene, prevention of tric phytosis, prompt and intensive treatment of cel litis when it occurs, and control of edema wh chronic venous insufficiency exists as a comp cating factor. Occasionally, it may be necess to resort to intermittent prophylactic chemothera or antibiotic therapy if the recurrences of celluli are frequent enough and are not controlled by t more conservative measures.

In the inflammatory forms of lymphedema, in the noninflammatory forms, the patient mu be carefully instructed as to the nature of disease if the physician is to gain his wholeheart cooperation.

SHARPER X-RAY PINPOINTING OF HEART ABNORMALITIES

A complex x-ray examination, selective angiocardiography, is helping to pinpoint heart abnormalities in infants and children amenable to corrective surgery, three Toronto, Canada, physicians have reported.

The procedure opacifies limited and predetermined portions of the heart and great vessels where these specific areas might not achieve absolute clarity by the venous angiocardiographic method, the three physicians added.

They are Dr. Richard D. Rowe, Dr. Peter Vlad and Dr. John D. Keith, all associated with the University of Toronto School of Medicine. Their report is published in a recent issue (March, 1956) of *Radiology*.

"Selective angiocardiography . . . is the method of opacifying limited and predetermined portions of the heart and great vessels. This procedure has been used by groups in Europe but at present its value has not been recognized widely on the North American continent," the Canadian specialists stated.

They also described the complex steps they fol in the procedure after first administering a sli anesthetic to the child, which induces a light sl during the examination.

"Twenty-nine infants and twenty-one older child (all but six under five years of age) have been stud by selective angiocardiography in our report. No u ward reactions have been encountered in this grou they reported.

Other conclusions advanced in their article:

The venous route is particularly helpful in s cyanotic infants (blue babies) where the range diagnostic possibilities is wider than at any other t

Intelligent use of the selective technique imp knowledge beforehand of the particular malformat Its value lies in making refinement of diagnosis poss rather than arriving at the diagnosis itself.

Clinical Notes

XYLOCAINE JELLY FOR TOPICAL URETHRAL ANESTHESIA

E. A. WEBB, M.D., B. A. SMITH, M.D.
and W. E. PRICE, M.D.
Minneapolis, Minnesota

TTAINING satisfactory local anesthesia of the male urethra, an important aspect of urologic p tice, is considerably facilitated by proper lubri- on during instrumentation. Xylocaine jelly tra) is an aqueous solution of 2 per cent lido- ne hydrochloride and 3.5 per cent sodium car- ymethylcellulose, which utilizes this principle b ombining a potent topical anesthetic agent in a ibricating base.

ylocaine was synthesized in 1943 by Lofgren Lundquist. Its safety and effectiveness as a ical urethral anesthetic have been attested by H nes and Grabstald (1949), Nesbit and Baum 52) and Persky and Davis (1953). These au- rs cite several patients voluntarily stating their p ference of Xylocaine to agents previously em- p ed. A patient of Persky and Davis with tran- t postcystoscopic syncope represents the only oward reaction to topical urethral Xylocaine slightly more than 1150 reported instances of t use.

his report concerns 122 male patients upon m 150 office procedures were performed ible I). No premedications were given. Fif- cubic centimeters of Xylocaine jelly were cted into the anterior urethra, massaged into t posterior urethra and retained for about five n nutes by a penis clamp applied at the coronal cus. Eighty-two patients underwent cysto- u throscopy. Conditions found in the fifty-two d gnostic procedures included benign prostatic h ertrophy, urethral strictures, posterior urethri- vesical calculi, vesical tumors, chronic intersti- cystitis and infection following transurethral p static resection. Twenty-seven patients had b dder tumor rechecks, and one patient had a s ll vesical recurrence coagulated without incident. Sixty-eight dilatations were performed for urethral strictures, vesical neck contractures and posterior urethral infection. No toxic or untoward reactions were encountered.

TABLE I

Number of Patients		112
Cystouretbroscopic Examinations		82
1. Diagnostic	52	
2. Bladder Tumor Rechecks	26	
3. Bladder Tumor Coagulation	1	
4. Urethroscopy and Urethral Dilatation for Stricture	3	
Dilatation Procedures		68
1. Urethral strictures	49	
2. Vesical neck contractures	17	
3. Posterior urethritis and prostatitis	2	
Total Number of Procedures		150

Comment

The cost of 15 cc. of Xylocaine jelly is approximately four times that of a comparable amount of cocaine. Does Xylocaine jelly possess advantages that justify this increased cost? The answer is in the affirmative for several reasons. More profound anesthesia is noted than with cocaine, allowing better relaxation and improved cystoscopic visualization of the posterior urethra and vesical neck. Postcystoscopic discomfort is virtually absent. Injury to mucous membranes has not been observed. Two patients with previous minor toxic reactions to cocaine experienced no difficulty with Xylocaine. Several patients expressed preference of Xylocaine to cocaine. We believe these observations adequately demonstrate its usefulness as a topical urethral anesthetic.

References

1. Haines, J. S., and Grabstald, H. J.: Xylocaine: a new topical anesthetic in urology. J. Urol., 62:901, 1949.
2. Lofgren, N., and Lundquist, B.: Studies on local anesthetics, II. Svensk. Kem Tidskr., 58:206, 1946.
3. Nesbit, T. E., and Baum, W. C.: Xylocaine gel, a new topical anesthetic agent. Univ. Michigan M. Bull., 18:157, 1952.
4. Persky, L., and Davis, H. S.: Xylocaine as a topical anesthetic in urology. J. Urol., 70:552, 1953.

305 Medical Arts Building

---

resented at the North Central Section, American ologic Association meeting in Chicago, Illinois, S tember 29, 1955.

Editorials

John F. Briggs, M.
Arthur H. Wells, M.
Henry G. Moehring, M.

A CONTRIBUTION OF CLINICAL PSYCHOLOGY TO PSYCHOSOMATIC MEDICINE

One of the major roles of the clinical psychologist in the field of psychosomatic medicine is that of the research investigator, attempting to verify whether or not significant relationships exist between certain disease states or medical syndromes and certain personality characteristics or behavior patterns. Because the clinical psychologist is trained in experimental design and research methodology, as well as in clinical methods, he has attempted to place many of the armchair hypotheses concerning psychosomatic disorders under scientific and objective scrutiny. He has also been critical of much of the alleged evidence that certain physiological disorders have definite and specific psychological correlates because in most studies: (1) the general character of the populations possibly lacks representatives in the sense that few cases are used, and the socio-economic status, age, sex, race, duration of illness, the amount of restricted activity due to illness, and other variables usually represent a small selected segment of the general population; (2) there is grossness of the observational methods used along with lack of attempts at quantification and demonstrative reliability of the data; (3) there is generally an absence of control groups; (4) there is sometimes a lack of experimental or clinical reproductivity because of the influence of specific theoretical points of view.

Because many investigators use a rather loose and unquantified language, it makes it difficult to check various assertions with known psychological techniques. For example, it is stated that persons having asthma are dependent and unconsciously fearful of separation from mother; hypertensive persons are submissive with chronic and inhibited hostility; peptic ulcer patients are overly ambitious and independent as a means of compensating for deep dependency needs. There is a possibility that perhaps present-day techniques used to evaluate such statements are not sensitive enough to measure such rather complex unconscious motivation. However, psychologists have attempted to restate many of these hypothe in testable form for objective and scientific stu with the techniques they currently have at th disposal. As a result, many of the previou held specificity theories of psychosomatic invol ment are beginning to fall by the wayside. In subsequent editorial, examples of psychosoma research by psychologists as individuals and members of a medical research team will discussed.

Murray S. Stopol, Ph
Clinical Pathologist, Han
Memorial Psychiatric Cli

ELECTROCARDIOGRAPHY: USE AND MISUSE

Electrocardiography has developed so rapi that periodic evaluations of its usefulness a necessary. Overemphasis may stress its value yond actual possibilities while underemphasis, m use by poorly trained workers, or disappointme in its findings occasionally cause unwarrant criticism.

Technique.—Following an initial period study, electrocardiographic technique was stan ardized, largely through the work of the sch of the late F. N. Wilson. This technique consi of the use of photographic or direct writing app ratus and of twelve leads: three standard lin leads, three augmented V leads of the lim (Goldberger's modifications), and six precordial leads. Other leads or additional tracings shou be taken by the physician himself in certain cas They are: the high V leads in cases with p sible anterolateral infarct; VE (xiphoid) and posterior leads V_7, V_8 in cases with possible p terior infarct; V_4R and V_3R in order to det right ventricular hypertrophy or focal block; and long strips of V_1 and aVF in atrial dis ders (especially doubtful cases of atrial flutter and long strips of lead 2 in cases with arrhythmi Moreover, functional tests (including the two-s exercise test and the amyl nitrite test) may useful in cases with precordial pain and norm resting ECG. Standard sizes of chest electro

.5 cm. for adults and 1.5 cm. for children) ould be used.

Artifacts.—Numerous artifacts are possible and e usually easily detected by inspecting the trac- g. Unfortunately, some of them may escape servation when the tracing is already mounted, pecially if only a short section is visible. Among em, improper shape of the waves due to over- oot ng, overdamping, or improper calibration, the most common.

Direct writing apparatus have justly become pular. However, improper functioning of the oving parts may add to the possible causes error. Only frequent technical inspections and licate handling guarantee an accurate reproduc- n of the patterns.

Mounting of a tracing is an easy chore which res the most stolid technicians. Few of them preciate that, in a few proven cases, normal rsons have been kept in bed for weeks and bmitted to unnecessary and enervating worry cause a technician mounted a tracing upside wn or substituted one lead (usually aVR) for other.

Application of the chest electrodes requires eat care. Smudging of a large surface with ctrode jelly may greatly change the pattern of e tracing. Use of normal instead of small chest ctrodes in infants or children may obtain the me result.

It is well known that muscular currents may ar an otherwise perfect tracing and may even nulate the existence of auricular fibrillation. w doctors know how to remedy this: the pa- nts should lie down comfortably, not sit; their nbs should be placed at a proper angle; their ind should be put at ease; in cases of somatic mor, round, flat electrodes applied over bony rfaces of the shoulders and pelvis may substi- te with advantage the conventional electrodes.

Interpretation.—Certain data are of great value the interpretation of a tracing. They are: e and sex; blood pressure, possible existence valvular defects; drugs received by the patient; ason for requesting a tracing; and information pplied by previous tracings (or a sample of em). Comparison between subsequent tracings ay be extremely important, both in cases of ronary heart disease and rheumatic carditis. wo subsequent tracings which are still within "normal limits" may reveal with their changes that a process in evolution is modifying the conditions of the myocardium.

The measurements of the P-R and of Q-T intervals are extremely important, particularly in cases of myocarditis.

In several diseases, information supplied by the electrocardiogram is inadequate and may even be misleading. Knowledge of this may be useful and indicate the need for a different method of study.

It is impossible to draw a sharp line between normal and abnormal tracings. In reaching a decision, the observer must consider the possible occurrence of a certain variation in the electrocardiogram of a normal person. Statistical tables are available and may be useful. However, personal experience and additional clinical and laboratory data help in determining whether an abnormality should be considered pathologic.

The most important diagnostic data are supplied by the ECG in the evaluation of atrial and ventricular rates, in the study of the electrical position of the heart, and in the evaluation of the conditions of the ventricular myocardium, especially for the study of changes of the coronary blood supply. Certain valuable data are also obtained in pericarditis.

It should be emphasized that the electrocardiographic patterns obtained in hypertensive heart disease, cor pulmonale, rheumatic valvular defects, and congenital heart diseases give only *indirect* evidence of the cardiac lesions and that evaluation of this evidence should be done carefully and with restraint.

In general, one should not try to draw unwarranted conclusions and to obtain from the reading of the ECG data which it cannot supply.

A. A. Luisada, M.D.
Chicago Medical School

THE CASHIER'S CHECK AND BANK DRAFT

Occasionally, in our personal or business dealings, an obligation is incurred which cannot be paid by remitting a personal check, but must be settled in cash or an acceptable substitute for cash. A familiar example of this type of situation is the closing of a real estate transaction. In circumstances where cash payment is demanded, the cashier's check and bank draft, although not legal tender, are usually a readily acceptable substitute for cash.

A cashier's check is drawn on the bank from which it is purchased and for all practical purposes is that bank's I.O.U. It will be made payable to the order of any person or persons whom the purchaser may designate. Traditionally, this check has been signed by the person who holds the office of cashier of the issuing bank; hence, the name cashier's check.

Banks also sell bank drafts which are checks drawn against an account the selling bank carries with one of its banking correspondents. If the payee can be satisfactorily identified, a bank draft can be immediately collected in a distant city at the bank on which it is drawn. Since it is not the practice of banks to issue instruments which will not be paid when presented, the cashier's check and the bank draft have come to be widely accepted in lieu of cash payments. This wide acceptance of cashier's checks and bank drafts makes it possible for customers to make large or small cash payments in their own community or at distant points without the inconvenience or risk of manually transporting or shipping currency and coins.

Clarence G. Frame, *Cashier*
The First National Bank
of Saint Paul

THE NATURE OF ALCOHOLISM

> "Whenever a disease is so widespread in the population, so serious in its effects, so costly in its treatment that the individual unaided cannot deal with it himself, it becomes a public health problem."—Thomas Parran, former Surgeon General, U. S. Public Health Service.

Cases of alcoholism are seven times more numerous than those of tuberculosis. A conservative estimate places the number of alcoholics in the United States at almost 4,000,000. Nearly 1,000,000 of these people have suffered physical or mental deterioration caused by their excessive drinking.

Alcoholism ranks among the major public health problems in the country. Some authorities say it is the fourth largest.

Alcoholism is a symptom of emotional illness. Alcoholism is a substitute safety valve for emotional pressures, and it is used only because the "good" safety valves are not working as they should. *This gives us the clue to successful treatment or rehabilitation of the alcoholic perso* whether that treatment involves individual psych therapy, group psychotherapy, A.A., pastoral cou seling, or casework services. The good valves mu be opened, and the substitute valves must l closed.

Alcoholism is no respector of persons, no cater to class, color or creed. It can slip up on tl doctor, the preacher, the painter or the hous wife.

One thing all people suffering from alcoholis have in common is an uncontrollable need for t effects of alcohol. To that degree, at least, th are equally sick people. Both need treatment halt the progressive development of their disord The alcoholic cannot do this by himself. *He nee help!* He desperately needs medical care, first keep him alive, so that, secondly, the resourc of medicine, the church, psychiatry and psych ogy supplemented by social welfare resources a attention can be brought into play to rehabilita him as a productive and self-sufficient citizen.

Paul S. Rahne
Citizens' Commission on Alc
holism, Inc., of Minneso

Fourth in a series of editorials on alcoholism.

THE HISTORY OF GLASS CONTAINERS

In the late pre-Christian era Egypt continu to produce glassware in increasing quantities, a her output was taken by Phoenician traders ports throughout the Mediterranean. Essent oils, wine, honey and so on, once packed in p tery, were put into glass which was found i finitely more efficient. Chemically inert, then now, the new glass containers added nothing and took nothing from, whatever was put in them. These first glass-packed products not o withstood long sea voyages, but long periods storage as well. And, as they could be used ag and again, the original cost was soon justifi As other countries became familiar with the p tective advantages of glass, they too, tried th hand at producing it with the result that gla making soon spread throughout the Mediterr ean.

Rome, among others, cast covetous eyes Egypt's thriving glass industry. In 30 B.C., wh Augustus added Egypt to his empire, he demand glass in tribute. Supplies failed to satisfy h

---

Second in a series of editorials on glass and g containers.

wever, and he ordered Egyptian craftsmen to me to Rome to train others in their art. Because Rome's patronage, the first four centuries of e Christian era are known as the First Golden ge of glass.

Following the fall of the Roman Empire, and ensuing Dark Ages, Venice became the artis- and cultural capital of the world. Glassmak- r was especially encouraged, and the Second lden Age of glass began in Venice about the th Century and lasted for about four hundred ars.

Like Rome in the First Golden Age, Venice d to import glassmakers at the outset. Artisans me from her colony in Syria, and were given val treatment. But rich and respected as they re, these skilled glassmakers were also closely arded and "protected," lest they—and their ills and trade secrets with them—be coaxed into her countries anxious to compete with Venice's ass industry.

Venice's star began to dim, however, and by e beginning of the 17th Century countries all er Europe were producing glassware, which ualed that of Venice in her greatest days. Bo- mia became famous for her magnificent ruby ass. Glass factories were founded in Antwerp 1550, in Brussels in 1662. Others sprang up Germany and Holland, in Spain and France. Glass factories were also blazing in England roughout the 16th Century. They could not, wever, satisfy ever-increasing demands, and gland was forced to import much of her glass. rther, coal had not yet come into general use, d the hungry fires of England's glass plants re depleting English forests. Officials of the ndon Company of Virginia accordingly turned eir eyes toward America with the hope of estab- hing—among many other things—new and ofitable glass factories on the wooded shores the new continent.

Sent out by the London Company, a small and urageous band of colonists under the direction Captain John Smith landed at Jamestown, rginia, in 1607 to establish the first permanent glish settlement in North America. A second oup—which included eight glassmakers—arrived Jamestown the following year, and, by the tumn of 1608, a glass factory was in operation the nearby forest about a mile from the settle- ent.

John M. Foster

TELEVISION: EVERYTHING FOR EVERYBODY?

"I'll buy a television set," the man said, "as soon as they start putting something really worthwhile on TV." You've met this man, possibly, although his ranks are thinning every day. The obvious question, of course, is how can he know anything about what "they" are putting on TV, if he starts out admitting he never sees it?

But there's another question, of much more significance to the nine out of ten people who *do* watch television. Does TV offer something of value in return for the time we give it?

The people most familiar with today's television are convinced it does. They realize television cannot suit every individual taste every minute of seventeen or eighteen hours each day. Neither television nor anything else can be everything to everybody.

Television's service to general knowledge comes directly in such programs as news, "See It Now," "Science in Action," "Omnibus," and a host of others—to name a few from the program schedule of WCCO-TV. Indirectly, television imparts valuable knowledge through such programs as "The $64,000 Question," "Hobby Showcase," "Highway Patrol." Even such sheer entertainment as "I Love Lucy," offers information through guests and comment on current events, social customs, and general contemporary life.

The average American home has been made into a center of information and entertainment not even the most wealthy could have enjoyed a decade ago. You and I—and our children—are familiar with the faces and voices of most of the great men of our age. We know the major cities and the great natural spectacles of the world. We've occupied front row seats at the top sports events; have watched great dramatic performances, operas, musical comedies. We've seen these things on our television sets—the next best thing to being at the scene in person. And past advances are only a prelude to future TV accomplishments.

In short, there are literally hundreds of TV features which may be watched with enjoyment and enlightenment by a literate adult, who may win mental stimulation and frequently a definite extension of his mental horizons. The best of them are as rewarding as anything you can introduce easily into your living room.

What's the answer to the fellow who says he won't watch television until "they start putting something really worth-while on TV?" Perhaps it's this: It's time to stop knocking TV's intelligence, and to recognize the surprising number of absorbing programs which truly add to general knowledge.

Gene Godt
WCCO-TV

MODERN PENOLOGY

Moderns recognize that man and his world are dynamic, not static. People and things change and no one has all the answers, but we should keep seeking the answers.

Penology (the study of how we handle criminals) has been changing since it got started. First, it meant "punishment." Later, out of necessity, it came to mean "correction." Penologists learned that mere punishment did not control criminal behavior. As moderns, they have sought for centuries better ways to combat crime.

This search has been inspired by all major religions and immeasurably aided by science. Medicine, through psychiatry, has helped to explain why we behave like human beings. Much has been learned from sociology, anthropology, jurisprudence and psychology.

Though society must properly hold the criminal responsible for his acts, it also distinguishes among criminals. As a result, we have witnessed the growth of hospitals for criminally insane, the juvenile court, youth commission and probation.

The penitentiary, as we know it, was established as a substitute for corporal and capital punishment. Like the other agencies mentioned, its job is to protect society. This it can do efficiently (albeit expensively) by keeping prisoners securely locked up. However, one cold fact makes this simple proposition meaningless because some *97 per cent of all prisoners eventually will be released.*

To truly protect society, prisons must do more than keep people locked up. They should try to prepare people for release to law-abiding lives. Given our present state of knowledge, this is not an easy task. But, do we really have any better alternative? Constructive work, sound discipline, case work, medical services, education, religion, and recreation all have a job to do in prison, with and for prisoners. When prisoners are released, it should be through the means of parole. This provides helpful, watchful supervision in the community toward the goal of a self-supporting, pr ductive parolee.

Some 2,000,000 felonies are committed in tl United States each year. We have the reputatio of being the wealthiest and least law abiding nations. Estimates vary, but all agree the annu cost of crime is enormous. Penologists and cri inologists can apprehend, arrest, convict, and i prison offenders. The ratio of people imprison to felonies reported is surprisingly low. Son 80,000 people are sent to prison each year, about one new convict for each twenty-five felo ies. A large number of crimes go unsolved. Son criminals we fail to convict, others get jail se tences or probation. The best weapon again crime is prevention. This is the big job, the o that all citizens have to face.

Douglas C. Ri
Warden, Minnesota State Pris
Stillwater, Minnes

REHABILITATION IN PULMONARY TUBERCULOSIS

The word rehabilitation is now in such comm use that it often threatens to become quite mea ingless. It is used for various remedial exercise for retraining of the fit, and vocational traini to new work of those unfit for their previous o cupations. It is applied to schemes for the psych logical treatment of those who suffer from ten peramental instability in conditions for whi they are emotionally unsuited. We see it defin as the rehousing and resettlement of norm healthy people in new satellite towns, and the unfit in settlements adapted to their speci disabilities. Sometimes, unfortunately, it mea nothing at all, but is a mere shibboleth and evasive answer to modern problems to which tl speaker has found no satisfactory answer.

The Oxford Dictionary defines rehabilitation "the action of restoring a former status or stan ing." In this definition, the operative word "former." If we accept this, it must follow th to settle a homeless worker in a new house wou go only part way in the complete process: tl new home must be in an area where he can foll his own trade and so maintain his full, form economic standing. To move tuberculosis suffer to new housing estates with higher rents wou be no answer to the bearing of housing in hygie surroundings on continued resistance. High rents mean a lowering in the value of real wag reduction in the amount of money available r food, clothing and the necessary luxuries of odern life can result in a lowering of general sistance out of all proportion to the gain in lutary air and in living space. Likewise, remed- l exercise in orthopedics are comparable with the der conception of sanatorium routine in rest ıd graded exercise: both approximate to true habilitation only if they restore full previous nction. They fail if they produce the maxi- um use of a lessened function, unless they are pplemented by a subsidy or a pension, which akes up the difference in earning power to the rmer pay-packet, or unless they lead to job- acement where lessened function can command at same pay-packet.

To be complete, the rehabilitation of the tuber- ılous person therefore implies a restoration found- l on a full knowledge of the individual patient's ıysical, psychological, economic and social needs. ıch a comprehensive scheme must be the ideal f every tuberculosis service. It is an integral part f the modern conception of treatment.

R. R. Trail
London, England

COTSON

Of late, we've gotten into a high-pitched lather bout the spelling, or rather the misspelling, of ıe Gaelic prefix for *son of;* i.e., we were confused y the MacDonalds, the Macdonalds, the Mc-)onalds, the M'Donalds, and even the M^{c}Don- lds. When we heard that the sons of Vikings ad organized counter-confusion with Anderson, ınderSon, AnderSn, Anders'n, and, so help us, ınders^{n}, we undertook some research. The ariations of the Viking suffix for *male offspring* f we can't vouch for, but the Gaelic we have raight and doubly verified by one of the most holarly, Campbell-hating Macdonalds who ever od the valley of the Coe.

In the old days, practically no one could spell things haven't changed so much), so to write ven an insult, the Gael had to find a scribe. he scribe was a fellow Scot, of course, and not t all above economizing on ink. This economy ok the form of chronic, creeping cheating which rogressively reduced the D to a ᴅ, then deleted ıe ᴀ, and finally overwhelmed even the ᴄ. Com- ıon decency was the only thing that saved the postrophe to stand in for the ᴀ and ᴄ. This as phase one.

Phase two came when Scots migrated to this country, Many having learned, in the meantime, to read and write. When they arrived in America they found untold numbers of McDonalds—all Irish and most of them attending a different kirk. Economy, be damned. The Scots hesitated not an instant. They spent their farthing for extra ink and reinserted the missing ᴀ's and ᴄ's in their names. And, we're told, 'tis the same story for the dir-r-r-ty Maclarens, and the bloody Macleods of Skye, and others.

The differences in spelling, then, are reduced to orthographic arrests at different evolutionary stages.

H.G.M.

DIAGNOSTIC USEFULNESS OF PERITONEOSCOPY

(Continued from Page 414)

Bibliography

1. Kelling, George: Ueber Oesophagoskopie, Gastroskopie und Kölioskopie. München. med. Wchnschr., 49:21-24, 1902.
2. Ruddock, J. C.: Peritoneoscopy. Western J. Surg., 42:392-405, 1934.
3. Ruddock, J. C.: Surg., Gynec. & Obst., 65:623-639, 1937.
4. Ruddock, J. C.: Peritoneoscopy: analysis of 900 cases. Vol. III, Ch. 16, Gynecology and Obstetrics, by Carl H. Davis. Hagerstown, Maryland, W. F. Prior and Co., 1941.
5. Hoffbauer, F. W., Evans, G. T., and Watson, C. J.: Cirrhosis of the liver: with particular reference to correlation of composite liver function studies with liver biopsy. Med. Clin. North America, 29:363, 1945.
6. Pearce, A. E.: Needle biopsy of the liver under peritoneoscopic vision. Gastroenterology, 27:46, 1954.
7. Royer, M. and Solari, A. V.: Cholangiography performed with the help of peritoneoscopy. Gastroenterology, 8:586, 1947.
8. Royer, M.: La cholangiographie laproscopique. Gastroenterologia, 83:110, 1955.
9. Royer, M., Colombato, L. O., and Mazure, P. A.: Peritoneoscopic cholangiography with manometric control. Gastroenterology, 26:626, 1954.
10. Waunagat, L.: Die Laproskopische Splenoportographie. Klin. Wchnschr., 33:750, 1955.
11. Seibel, D. I.: Culdoscopy. Bull. Univ. Minn. Hosp. Minn. M. Found., 24:503, 1953.
12. Carey, J. B., Jr.: Peritoneoscopy. Bull. Univ. Minn. Hosp. M. Found., 25:561, 1954.
13. Hegstrom, G. J., Zoeckler, S. J., and Keil, P. G.: Peritoneoscopy, Gastroenterology, 25:243, 1953.

President's Letter

PHYSICIANS AND SOCIAL SECURITY

Many doctors in Minnesota and the nation are still asking why organized medicine is opposed to social security coverage for their profession on a compulsory basis. For a profession that has been and still is threatened with socialization, this is hard to understand. Certainly, anyone who has taken the time to read the numerous articles appearing in the J.A.M.A., our own MINNESOTA MEDICINE and special articles prepared by Dr. Frank H. Dickenson, director of the Bureau of Economic Research of the American Medical Association, should be convinced that the whole Social Security program or Old Age and Survivors Insurance program, as it is now designated, is not actuarially sound, is definitely socialism. rapidly approaching Townsendism, and is putting an enormous financial burden on our children and grandchildren for generations to come.

In the first place, OASI is not insurance. Insurance means a contract; one party agrees to provide certain returns for certain definite premiums paid in. Once the contract is made, it is binding; the rates cannot be changed; the rewards cannot be altered. But in OASI, the Act that established it definitely states in Section 1104: "The right to alter, amend or repeal any provision of this act is hereby reserved to the Congress." Through Title Two of the Social Security Act, Congress has created a system providing statutory rights to statutory benefits. Such rights are not natural, constitutional nor contractual rights.

Social Security tax rates have already risen and at present are 3 per cent of the first $4,200 of the self-employed individual's income.

Provision is now made for this to increase to 3.75 per cent from 1960 to 1964, 4.5 per cent from 1965 to 1969, 5.25 per cent from 1970 to 1974 and 6 per cent starting in 1975. On earnings of $4,200 per year, the projected raises will increase the tax from $126 per year to $252 by 1975. If the controversial H.R. 7225 pertaining to cash benefits to disabled at age fifty should pass through Congress, this percentage would rise to 3.75 per cent immediately. Already the tax base has risen from $3,600 income to $4,200 income, and there is nothing to prevent any future Congress from raising it to $4,810, $6,000 or any additional figure.

The parties pressing for OASI for physicians make much of the survivors' benefits. Let us look at survivors' benefits for a moment. A physician has a wife and two children, and a net income of $3,600 per year. He dies. His widow collects $168.75 per month until the eldest child reaches eighteen years of age; then the amount drops to $127.50 per month until the second child reaches eighteen. Then it all stops until the widow reaches sixty-five, at which time it resumes at the rate of $63.80 per month unless she remarries.

However, if this same self-employed physician were carrying a $20,000 ordinary life insurance policy, which he should be, he could add a twenty-year family income clause to his policy which in event of his death, would provide $200 per month to his family for twenty years from the date of the policy, or if he died three years after taking out such family protection, it would pay $200 monthly for seventeen years after his death. Such coverage would cost him approximately $85 additional premium on his ordinary life policy, much less than the $126 for OASI, and his wife would get this income for the stated period, whether she was gainfully employed or not and whether she remarried or not. Such insurance is a definite contract provided by extra premiums, has a definite scale of benefits and is enforceable in the courts.

The situation of the employed persons covered under OASI and those persons, now some 20 million, covered under various industrial pension plans or profit-sharing plans, is definitely different. Under the Social Security Act, both employe and employer contribute to the fund by taxation and returns to the employe in retirement benefits after reaching the age of sixty-five will amount to approximately $30 for each dollar paid into the fund.

In December, 1954, the Ways and Means Committee of the House released a report entitled "Social Security after Eighteen Years." These statements in that report are significant:

> "When eligible persons aged 65-75 (now 65-72) earn too much, they must forego their benefits, as well as continue to pay OASI taxes," or:
>
> "There is not enough in the OASI trust fund of $17 billion to pay future benefits to the present beneficiaries," or:
>
> "Today's OASI taxpayers who become beneficiaries tomorrow must look to those working and paying OASI taxes for their benefits," or:
>
> "Total benefits to some aged couples may aggregate several hundred times the amount they paid in OASI taxes."

This certainly does not sound like an actuarially sound insurance program.

Under the many profit-sharing plans set up by companies to provide for retirement pay, the employer may set aside as much as 15 per cent of the employe's annual pay each year and not have to pay income taxes on this amount.

Under some pension plans, an employer may contribute as high as 200 per cent of the employe's annual wage, without violating the internal revenue code, that is without making the contribution currently taxable income to the employe. These contributions to pension plans by employers are tax deductible as a business expense to the employer and the employe pays no income tax on such amounts until he starts to participate in the pension benefits after retirement.

The self-employed have never had any similar opportunity to defer payment of income taxes on whatever they may be able to set aside for their retirement. The Jenkins-Keogh bills (H.R. 9 and H.R. 10, January 15, 1955), are designed to provide similar tax deferment for the self-employed up to 10 per cent of earned income in any year up to age 65.

Last month, our state office conducted a poll of all our members asking them to vote on the question, "Do you favor extension of the Old Age and Survivors Benefits coverage of the social security program to physicians? And if so, do you approve of it on a voluntary or on a compulsory basis?"

I hope the information provided here will help you decide whether you want to participate in such a program or whether you want to provide your own retirement fund, aided in so doing by adoption of some plan of deferred income tax such as that incorporated in the Jenkins-Keogh bills.

R. H. Wilson

President, Minnesota State Medical Association

Medical Economics

Edited by the
Committee on Medical Economics,
Minnesota State Medical Association
George Earl, M.D., Chairman

FORD FOUNDATION GIVES $10 MILLION TO FUNDS FOR MEDICAL SCHOOLS

A $10 million program of grants to the National Fund for Medical Education was announced in mid-April by H. Rowan Gaither, Jr., president of the Ford Foundation. The National Fund for Medical Education is the organization which distributes to the medical schools the funds raised by the American Medical Education Foundation along with the contributions made by industry and the general public.

Gaither said the Ford Foundation grants will be made on a matching basis over a five to ten-year period with a maximum grant in any one year limited to $2 million.

In 1955 the National Fund received $2,147,000 in unearmarked funds for distribution to the nation's medical schools. Of this amount, an unearmarked $422,812 came from the medical profession through the American Medical Education Foundation. Under the Ford Foundation formula, if 1956 receipts are equally large, there would be a Ford grant totaling 70 per cent of this amount or $1,503,486. All contributions in excess of the 1955 total would be matched dollar-for-dollar, subject to the annual maximum of $2 million.

After 1956, each year's grant would match the preceding year's receipts on a diminishing scale but all receipts over the preceding year's total, would be matched dollar-for-dollar up to the $2 million ceiling.

The announcement of these matching grants is heartening to physicians who have contributed to the medical schools through the A.M.E.F. It will mean that for every unearmarked dollar contributed to A.M.E.F., another 70 cents to a dollar will be given by the Ford Foundation, thereby stimulating the additional support the nation's medical schools have so desperately needed.

WHY HOSPITAL COSTS ARE HIGH

After a careful analysis of the period from 1946 to 1954, Ray E. Brown, president of the American Hospital Association, recently explained why hospital costs are high. He also predicted that "hospital costs would continue to increase at about five per cent annually for many years."

His article, "The Nature of Hospital Costs" appears in the April 1, 1956, issue of *Hospitals,* the journal of the American Hospital Association.

"Whatever answers there are to the problem of hospital costs must be found in the area of personnel budgets," he said.

Contrasting the hospital as a personal service institution with general industry, Mr. Brown wrote:

> "The nature of the hospital's work provides little opportunity for . . . productivity gains. Nonetheless, hospital salary levels are affected by general salary levels. Under such circumstances every round of salary increases constitutes a direct increase in hospital costs. Over the years ahead, as the general labor force continues to receive its rightful share of the proceeds from increased productivity, hospitals will be compelled to give equal increases in salary without comparable benefits from increased productivity."

NEW AMERICAN MEDICAL DIRECTORY COMPLETED

After twenty months of work, the 19th edition of the American Medical Directory has been completed. The price is $30 per copy including postage within the United States. Orders may be placed by writing Philip E. Mohr, Directory editor, American Medical Association, 535 North Dearborn Street, Chicago 10, Illinois.

The new directory shows a 16,784 gain in the total number of physicians since 1950. The Pacific states show the largest increase with a gain of 23 per cent over the 1950 figures. States showing a substantial increase in the number of physicians include California, Florida, Texas, Ohio, Michigan and New York. Slight losses in number occurred in Arkansas, Illinois, Iowa, Missouri, Vermont and West Virginia.

The Directory also shows that 30 per cent of the physicians in the United States are in general practice; 10 per cent give special attention to a specialty but do not limit their practice to it; 31 per cent limit their practice to a specialty; 11 per cent are serving internships or residencies; 6 per cent are in other full-time hospital services, 5 per cent are retired or not in practice; 4 per cent are not in private practice and 3 per cent are temporarily in military service or serving in various government agencies.

JUDD SPEAKS AT SAMA MEETING

Minnesota Congressman Walter Judd spoke at the sixth annual Student American Medical Association convention at the Sherman Hotel, Chicago, May 5. His subject was "The Doctor's Place in Public Affairs."

The AMA honored the 1956-57 officers and councilors of the SAMA at a reception Sunday, May 6.

SENATE COMMITTEE APPROVES TWO HEALTH BILLS

The Senate Public Welfare Committee has nanimously approved two health bills. One ould authorize the Public Health Service to unertake the continuing collection of data on the revalence and incidence of the major categories f sickness and disability.

The second bill would authorize $5 million for ie construction of a building to house the Naonal Institute of Dental Research.

TWO MEASURES MAY AFFECT AGED

President Eisenhower has established a Federal Council on Aging. This Council will consist of epresentatives of 12 Federal agencies which have special concern with aging. It will have a genral co-ordinating function in an effort to achieve more effective government-wide approach to the needs of older persons.

A bill has been reintroduced by Representative ohn D. Dingell (D., Mich.,) affecting hospitalizaion of the aged. Its provisions, in brief, call for a maximum of 60 days free hospitalization a year f ordered by a physician and for any social security beneficiary or dependent. Excluded would be surgery or medical care (except that generally furnished by a hospital), tuberculosis, mental conditions or domiciliary or nursing type care. Included would be nursing and lab, drug and operating room costs. The Secretary of HEW would make regulations with advice from the Federal Hospital Council. Operating as agents of the U. S., states would make arrangements with hospitals. Payment would come out of the OASI Trust Fund without additional tax.

NEW VERSION OF ALASKAN MENTAL HEALTH BILL PROPOSED

Senator Goldwater (R., Ariz.,) has drawn up a bill that would amend the House-passed Alaskan Mental Health Bill. It would amend the House measure to give the Territory of Alaska the responsibility of working out commitment procedures. The commitment section of the House bill produced considerable opposition from some groups. The AMA favored the House-passed bill but as yet has not passed on the Goldwater proposal.

OFFICE OF CIVIL AVIATION MEDICINE PROPOSED

The Chairman of the House Interstate and Foreign Commerce Committee has proposed that the Administrator of Civil Aeronautics be given authority over medical aspects of civil aviation including pilot examinations and the establishment of minimum human requirements in aircraft design. These are currently the responsibility of the Civil Aeronautics Board. An Office of Civil Aviation Medicine would be set up within CAA as well as a research laboratory and a medical advisory committee.

U. S. WARNS PUBLIC AGAINST HOXSEY CANCER TREATMENT

For the first time in recent years, the Food and Drug Administration issued a public warning . . . to "sufferers from cancer, their families, physicians and all concerned with the care of cancer patients" to avoid the Hoxsey treatment developed by Harry M. Hoxsey, of Texas.

The public warning says in part:

> "The Food and Drug Administration has conducted a thorough and long-continuing investigation of Hoxsey's treatment. His claimed cures have been extensively studied and the FDA has not found a single verified cure of internal cancer effected by the Hoxsey treatment."

FDA Commissioner George P. Larrick points out that Harry Hoxsey and "all persons in active concert with him" in the treatments were enjoined October 26, 1953, from shipping their "worthless cancer medicines" in interstate commerce with labeling representing or implying that the products are effective in the treatment of any type of internal cancer.

While the U. S. plans prosecution of violations of the injunctions, Mr. Larrick says the warning is issued "for the immediate protection of cancer victims. . . ."

MILITARY MEDICAL LEGISLATION BILLS GO THROUGH HOUSE

Two bills concerning military medical legislation went through the House without change recently after detailed hearings and study by a subcommittee. One is designed to make military medical careers more attractive by allowing credit for time spent in medical school and internship and by setting up a series of three $50 per month raises after three, six and ten years' service. These would be in addition to the present $100 per month special pay for medical officers. Public Health Service medical officers would benefit as well as those in the Army, Navy and Air Force.

The other bill well on its way to becoming a law allows dependents of servicemen to receive private hospital and medical care with the government paying the cost of the insurance or health plan coverage and the dependent the first $25 of the hospital bill. The Secretary of Defense could limit or deny such private care in areas where he determines that military medical facilities are adequate to handle the service families.

FEE COMPLAINTS NOT NECESSARILY BASED ON FEES

The Mediation Committee of the Wayne County (Mich.) Medical Society found that fee complaints are less likely to arise from the size of the fee than from the doctor's failure to explain his services. This group completed a study of the reasons behind 56 recent protests to the committee.

In only three of those cases, it reports, did patients refuse to pay because they considered the fees themselves unreasonable.

Sixty per cent of the patients with grievances balked at paying because, in their opinion, the physician in the case had rendered them no real service. In another 25 per cent of the cases, fee complaints appear to have been caused by "insurance problems and improper billing procedures."

The final 15 per cent of the fee complaints reportedly stemmed from patients' doubts about the quality of service they had received.

Dr. Luther Leader, chairman of the committee, concluded that "half the cases were settled by explanation only. And how much more satisfactory for all concerned if these explanations had come from the physician rather than the committee. If each doctor had spent more time with each patient, there would have been little left for the mediation committee to do."

AMA LAW DEPARTMENT SPONSORS MEETING

Attorneys representing medical societies gathered in Chicago for a two-day meeting in April. This was the first formal full-scale attempt to bring together attorneys who are called upon to advise medical society clients on their many legal problems. Panel discussions were conducted on antitrust laws and related problems, the corporate practice of medicine, grievance committees and disciplinary problems, professional liability, interprofessional codes of conduct and legislative and lobbying activities.

MEDICAL ASSISTANCE BILLS INTRODUCED

Administration-sponsored amendments to the Social Security Act which would provide separate matching by the states of public assistance payments for medical care were taken up by the House Ways and Means Committee in April. Bills are sponsored by Representative Jere Cooper, (D., Tenn.,) and Representative Dan Reed, (R., N.Y.,) in the House and by Senator Martin (R., Pa.,) in the Senate. Under these bills the federal contribution to a state for medical care would be $3 a month per adult recipient and $1.50 for a child, with the state required to match dollar-for-dollar. Under the present setup public assistance payments going to the states are not specifically earmarked for medical care.

COMMISSIONS FOR OSTEOPATHS STILL IN DOUBT

A bill to give osteopaths military commissions has bogged down temporarily in the Senate Armed Services Committee. The Defense Department's medical chief, Dr. Frank Berry, backs the idea, but his Service surgeons-general all oppose it.

GOVERNMENT INVESTIGATES ABUSES IN VA OUTPATIENT PROGRAM

The medical profession came out with a nearly clean bill of health in the government's recent survey on abuses in the outpatient program of the Veterans Administration. The survey disclosed that a number of physicians had made mistakes in charging for the treatment of veterans but only a few deliberately cheated. Representative Olin Teague, (D., Tex.,) chairman of the House Veterans Committee which demanded the survey, said the abuses ranged from "minor administrative failures to serious false claims" and referred the cases to the Justice Department for prosecution.

"Certainly these abuses do not provide a basis for the generalization that there is dishonesty in the medical profession," he said. "They do, however, show that in any large program involving many thousands of individuals a certain amount of carelessness, misunderstanding and, in a few cases, outright dishonesty will creep in."

Meanwhile the Veterans Administration says it has not found many abuses in its disability compensation and pension programs. In an investigation of more than 400,000 cases, it has found nearly 96 per cent of the claims entirely accurate.

THE MIGHTY MUSHROOM

In Central Europe and in Pennsylvania, folklore credits the eating of certain species of mushrooms with protective effect against development of human cancers Extracts from ten of eighty species examined do indeed demonstrate some inhibitory effect upon transplanted cancers in mice, report Dr. E. H. Lucas and Joseph Stevens, Michigan State University. The extracts apparently contain some cancer-retarding factor, according to the studies done in collaboration with the Sloan Kettering Institute, New York. The factor is apparently heat resistant. None of the extracts has yet been purified sufficiently for human experiments, and any role in providing clues toward cancer control is ye unknown.—Medigrams: *GP* 12:240 B (Oct.) 1955.

n Memoriam

VILLIAM H. CONDIT

Dr. William H. Condit, treasurer of the Minnesota tate Medical Association since 1932, died April 21, 956. He was eighty-four years old.

A long-time specialist in obstetrics, gynecology and rgery, Dr. Condit had practiced medicine in Minnepolis since 1899.

He graduated from the University of Minnesota Medcal School and interned at St. Barnabas Hospital, Mineapolis. He became a fellow of the American College f Surgeons in 1922 and joined the Nicollet Clinic, Mineapolis, in 1924. He was also a teaching assistant at he University of Minnesota Medical School.

Dr. Condit was a former vice president of the Minneota State Medical Association and in 1952 the Assoiation awarded him its highest honor, the distinguished ervice award.

He had been a staff doctor at Northwestern, Doctors Memorial, and University Hospitals.

His memberships included the Academy of Medicine, he American Medical Association, the Southern Minnesota Medical Association and the Hennepin County Medical Society.

Survivors include a sister-in-law, Mrs. Mayme Dann, Minneapolis. Dr. Condit's wife died many years ago. Interment was in Albany, New York.

EVERETT C. HARTLEY

Dr. Everett C. Hartley, St. Paul obstetrician and gynecologist, died May 2, 1956. He was sixty-five years old.

A native of Carver, Minnesota, Dr. Hartley graduated from Beloit College, Beloit, Wisconsin, and received his medical education at the University of Minnesota. He did postgraduate work in Berlin and during World War I he served with the 26th Medical battalion in France. After the Armistice, Dr. Hartley was attached to the Red Cross in Poland for two years.

An associate professor at the University of Minnesota medical school, he was a member of the Ramsey County Medical Society, the Minnesota State Medical Association and the American Medical Association. He also belonged to the Central States Association of Obstetrics and Gynecology, the Minnesota Association of Obstetrics and Gynecology and the Travel Club.

Dr. Hartley was a consultant in maternal and child health for the division of child welfare, Minnesota Department of Health.

Survivors include his wife, Zita; a son, Everett Charles, Jr., two daughters, Jane and Mrs. Harold L. Korn, New York City, and a brother, Scott, Carver, Minnesota.

PAUL A. HIGBEE

Dr. Paul A. Higbee, who practiced medicine in Minneapolis nearly fifty years, died March 29, 1956. He was eighty-two years old.

Born in Red Wing, he attended the University of Minnesota where he was a member of Delta Kappa Epsilon fraternity. He was graduated from Hahnemann Medical College, Philadelphia, and served as a captain in the army medical corps during World War I.

He was a member of Khurum Masonic Lodge and of Scottish Rite bodies of Minneapolis and was a 32nd degree Mason.

Dr. Higbee was a member of the Hennepin County Medical Society, the Minnesota State Medical Association and the American Medical Association.

Surviving are his wife, Louise, and two sisters, Mrs. Earle G. Nunnally, Cincinnati, Ohio, and Mrs. Reginald J. Healy, Minneapolis.

RUFUS O. JOHNSTON

Word has just been received of the death last December of Dr. Rufus O. Johnston, former physician for Independent School District Number Twenty-Seven, Hibbing, Minnesota.

Dr. Johnston died in Florida. He was fifty-four years old.

A graduate of the University of Minnesota Medical School, he practiced in Harrington Park, New Jersey, for a number of years and served as a medical officer in the U. S. Army during World War II.

He was a member of the St. Louis County Medical Society, the Minnesota State Medical Association and the American Medical Association.

Dr. Johnston is survived by his wife and two daughters.

HENRY W. NOTH

Dr. Henry W. Noth, a retired staff member of St. Barnabas Hospital, Minneapolis, died March 27, 1956. He was seventy-eight years old.

Born in Maple Grove, Dr. Noth practiced medicine in Minnesota for more than fifty years. In 1953, he was inducted into the fifty-year club of the Minnesota State Medical Association.

He was also a member of the Hennepin County Medical Society, the American Medical Association, Hennepin Masonic Lodge Number 4, Scottish Rite Temple and Izaak Walton League.

Dr. Noth graduated from the University of Minnesota Medical School in 1903.

Surviving are a son, Dr. Paul H. Noth, Los Alamos, New Mexico; a daughter, Mrs. Katherine Chambers, and a sister, Mrs. Albert McKenzie, both of Minneapolis.

HOMER M. McINTIRE

Dr. Homer M. McIntire, pioneer Waseca, Minnesota, physician, died April 18, 1956. He was seventy-one years old.

Born in Winchester, Ohio, he attended Park Academy

(Continued on Page A-34)

Meetings and Announcements

MEDICAL MEETINGS

State

Minnesota Society of Obstetrics and Gynecology, fall meeting, Rochester, Minnesota, September 22. Dr. Edward A. Banner, secretary, Rochester, Minnesota.

National

American Association of Blood Banks, ninth annual meeting, Somerset Hotel, Boston, Massachusetts, September 3-5. Secretary Marjorie Saunders, 725 Doctors Building, 3707 Gaston Ave., Dallas, Texas.

American Heart Association, 29th annual scientific session, Cincinnati, Ohio, October 26-29. Write American Heart Association, 44 East 23rd Street, New York 10, New York.

American Society of X-Ray Technicians, annual convention, Kentucky Hotel, Louisville, Kentucky, June 17-21.

Minnesota-Dakota-Manitoba Orthopedic Society, annual meeting, Red Wing, Minnesota, September 7 and 8. Dr. Hollis Ahlrin, secretary, Rapid City, South Dakota.

National Society for Crippled Children and Adults, annual convention, Hotel Statler, Washington, D. C., October 28-31.

Postgraduate Medical School of New York University—Bellevue Medical Center, eight-week course in occupational medicine, September 10-November 2. Write Dean, N.Y.U. Postgraduate Medical School, New York 16, New York.

Symposium for General Practitioners on Tuberculosis and Other Chronic Pulmonary Diseases, fifth annual meeting, Saranac Lake, New York, July 7-13. Dr. Edward N. Packard, general chairman, Symposium for General Practitioners, P.O. Box 262, Saranac Lake, New York.

University of Illinois Department of Otolaryngology, Annual Assembly in Otolaryngology, October 1-7. Write Department of Otolaryngology, 1853 West Polk Street, Chicago 12, Illinois.

West Virginia State Medical Association, 89th annual meeting, The Greenbrier, White Sulphur Springs, West Virginia, August 23-25.

International

Congress of International Society of Hematology, Hotel Somerset, Boston, Massachusetts, August 27-September 1. Dr. W. C. Moloney, secretary, 39 Bay State Road, Boston, Massachusetts.

European Congress of Cardiology, Stockholm, Sweden, September 10-14. Dr. Karl E. Grewin, secretary, Sodersjukhuset, Stockholm, Sweden.

Inter-American Congress of Cardiology, Havana, Cuba, November 4-10. Dr. Ramon Aixala, Apartado 2108, Havana, Cuba.

International Congress of Clinical Chemistry, Hotel New Yorker, New York, September 9-14. Secretary, John G. Reinhold, 711 Maloney Building, University of Pennsylvania, Philadelphia 4, Pennsylvania.

International Congress of Gastroenterology, London, England, July 18-21. Herman Taylor, secretary, London Hospital, White Chapel, London E. 1, England.

International Congress of Internal Medicine, Madrid, Spain, September 19-23. Dr. J. C. DeOya, secretary, No. 90, Madrid, Spain.

International Congress of International College of Surgeons, Palmer House, Chicago, Illinois, September 9-13. Dr. Max Thorek, secretary general, 1516 Lake Shore Drive, Chicago, Illinois.

International Congress of Radiology, Mexico, D. F., Mexico, July 22-28. Dr. Jose Noriega, secretary, Tepic 126 (2 e piso), Mexico, D. F. 7, Mexico.

International Congress on Diseases of the Chest, Cologne, Germany, August 19-23. Murray Kornfeld, executive director, 112 East Chestnut St., Chicago 11, Illinois.

Pan American Congress on Cancer Cytology, Miami Florida, January 8-12, 1957. Dr. J. Ernest Ayre, chairman, 1155 N. W. 14th St., Miami, Florida.

World Medical Association, Havana, Cuba, October 9-15. Dr. Louis H. Bauer, secretary general, 345 East 46th St., New York 17, New York.

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY

October 1 is the deadline date for receipt of applications for the 1957 Part I examination for the American Board of Obstetrics and Gynecology. Further information can be obtained from Dr. Robert L. Faulkner Secretary, American Board of Obstetrics and Gynecology, 2105 Adelbert Road, Cleveland 6, Ohio.

AMERICAN COLLEGE OF PHYSICIANS

The American College of Physicians held its 37th nnual session at Los Angeles, California, April 16-20. Elected to membership in the group were Dr. Norman A. Christensen, Dr. John E. Estes, Dr. Donald R. Nichols and Dr. Maurice H. Stauffer, all of Rochester; Dr. Benjamin F. Fuller and Dr. Herbert W. Johnson, both of St. Paul; Dr. William B. Martin, Duluth; Dr. Neil D. Nickerson, Fairmont, and Dr. Harold E. Miller, Minneapolis.

AMERICAN HEART ASSOCIATION PROCEEDINGS PUBLISHED

Proceedings of the American Heart Association's 1955 annual meeting of the Council for High Blood Pres-ure Research, held in Cleveland last November, have been published in book form. Containing eight papers and verbatim transcripts of discussions, the proceedings offer a roundup of recent knowledge in the field of hypertension, with emphasis on neurovascular aspects. Further information is available from the American Heart Association, 44 East 23rd Street, New York 10, New York.

INTERNATIONAL COLLEGE OF SURGEONS SCHOLARSHIPS

The awarding of three $3,000 scholarships for postgraduate study in surgery has been announced by the United States and Canadian sections of the International College of Surgeons. The funds were made available by the Woman's Auxiliary to the two sections. The auxiliary also has made funds available to pay the expenses, not exceeding $300, of two residents or fellows in training as surgeons to enable them to attend the 21st annual Congress of the United States and Canadian sections in Chicago, September 9-13, and to present suitable clinical or scientific papers before the assembly. Information may be obtained from the International College of Surgeons, 1516 Lake Shore Drive, Chicago 10, Illinois.

INTERNATIONAL CONGRESS ON DISEASES OF THE CHEST

The fourth International Congress on Diseases of the Chest of the American College of Chest Physicians will be held in Cologne, Germany, August 19-23. Eighty-six countries will send representatives to the meeting. The congress will place special emphasis on surgery for coronary diseases. For detailed information, write Fourth International Congress of the American College of Chest Physicians, Köln-Deutz, Germany, Messeplatz.

MINNESOTA SOCIETY OF NEUROLOGY AND PSYCHIATRY

The Minnesota Society of Neurology and Psychiatry held a morning meeting at Rochester on May 19. A program of surgical clinics at St. Mary's Hospital was followed by a scientific session, at which papers were presented by Dr. Alfred Uihlein, Dr. Henry W. Dodge, Jr., Dr. J. G. Rushton, Miss Josephine Simonson, Dr. Howard P. Rome, Dr. D. W. Mulder and Dr. David D. Daly. At a luncheon in the Kahler Hotel the principal speaker was Dr. C. H. Hodgson, who spoke on "Africa, the Changing Continent."

NORTHERN MINNESOTA MEDICAL ASSOCIATION MEETING

The annual meeting of the Northern Minnesota Medical Association will be held at Alexandria on September 7 and 8. The meeting will begin on Friday at 10:00 a.m. and continue until Saturday noon. Scientific sessions will be held in the auditorium of the Alexandria Clinic. A detailed program will be published later.

MINNESOTA MATERNAL MORTALITY STUDY

(Continued from Page 386)

adequacies of death certificate reporting are again apparent in this study.

7. Autopsies were obtained in 49.2 per cent of the deaths. This shows considerable improvement over previous studies and reflects more effort and interest in the study of these cases by the local physicians.

8. The primary causes of maternal deaths in Minnesota in the 1953 study are tabulated. Toxemia was the leading cause as it was in 1950. Deaths due to hemorrhage headed the list in 1951 and 1952. Three of the deaths due to toxemia were considered to be preventable.

9. The hemorrhage deaths are discussed briefly. All of these were considered preventable.

10. The dangers of carelessness in transfusion technique are emphasized by the deaths due to transfusion accidents. These equaled the number due to hemorrhage. These two causes combined accounted for as many deaths as did toxemia.

References

1. Maternal Mortality Committee, Minnesota State Medical Association: Maternal Mortality Study, July 1, 1941, through June 30, 1942. Minnesota Med., 27:475-481; 557-562, 1944.
2. Maternal Mortality Committee of the Committee on Maternal Health of the Minnesota State Medical Association: Minnesota Maternal Mortality Study. Minnesota Med., 36:609-622 (June) 1953.
3. Maternal Mortality Committee of the Committee on Maternal Health of the Minnesota State Medical Association; Minnesota Maternal Mortality Study. Minnesota Med., 37:131-135 (Feb.) 1954.
4. McKelvey, J. L., and Freeman, D. M.: Critical Evaluation of the Minnesota Maternal Mortality Study. Am. J. Obst. & Gynec., 68:29-37 (July) 1954.
5. Maternal Mortality Committee of the Committee on Maternal Health of the Minnesota State Medical Association: Minnesota Maternal Mortality Study. Minnesota Med., 38:9-15 (Jan.) 1955.

General Interest

Dr. Fred W. Wittich, Minneapolis, presented a paper at the thirteenth annual meeting of the American Geriatrics Society at the Palmer House in Chicago on May 3 and 4. Dr. Wittich recently retired from active duty with the American College of Allergists and now is devoting his time entirely to his private practice and editing the *Quarterly Review of Allergy and Applied Immunology.* At the twelfth annual meeting of the American College of Allergy, held recently in New York, Dr. Wittich was made president emeritus of the organization.

* * *

Dr. Reno W. Backus, staff member of Nopeming Sanatorium, Nopeming, since 1943, has been named superintendent and medical director of the sanatorium. He succeeds **Dr. G. A. Hedberg,** who died in March. A graduate of Rush Medical College in 1925, Dr. Backus began practice in 1928 in Peking, China, where he served as superintendent of the Hopkins Memorial Hospital until 1941.

* * *

New chairman of the St. Paul Area Health Council is **Dr. Frederick M. Owens, Jr.,** St. Paul.

* * *

Dr. H. Herman Young, Rochester, chairman of the orthopedic surgery sections of the Mayo Clinic, was toastmaster at the Minnesota Safety Council's annual award presentation dinner in Minneapolis on May 1. Dr. Young, a member of the executive committee of the council, has been active in the control and prevention of farm and industrial accidents.

* * *

Dr. Lewis Hanson, Frost, was elected chief-of-staff of the Blue Earth Community Hospital at the annual election meeting of the hospital staff recently. He replaces **Dr. H. H. Russ,** Blue Earth. Named as secretary-treasurer was **Dr. James A. Anderson,** who recently joined the staff of the Blue Earth Medical Center.

* * *

Dr. William B. Tucker, former chief of the tuberculosis service at Minneapolis Veterans Hospital, will become director of the VA tuberculosis service in medicine and surgery in Washington, D. C., on September 1. For the past two years since leaving Minneapolis Dr. Tucker has been chief of the medical service at the veterans hospital at Durham, North Carolina.

* * *

At the 53rd semi-annual Postgraduate Extension Course at Marshall on April 17, **Dr. Merrill D. Chesler,** Minneapolis, spoke on "The Treatment of Burns in Children; the Treatment of Birthmarks and Related Congenital Abnormalities." The extension course was sponsored by the University of Minnesota, the Lyon-Lincoln County Medical Society and the Minnesota State Medical Association.

Dr. Chesler also was the principal speaker at a meeting of the Kandiyohi-Swift-Meeker County Medical Society in Willmar on April 19, where his topic was "Practical Applications of Skin Grafts and Flaps."

* * *

Dr. James T. Priestley, Rochester, recently received an honorary doctor of laws degree from the University of Alberta.

* * *

Dr. John S. Milton has been made a member of the board of trustees of Swedish Hospital, Minneapolis **Dr. A. E. Johnson** has been re-elected treasurer of the board.

* * *

Dr. Jan H. Tillisch, Rochester, was elected president of the Aero Medical Association at the annual meeting of the organization in Chicago in mid-April. Dr Tillisch, who was in the Air Force during World War II, is a member of the International Air Transport Medical Committee and is associated with the American Board of Aviation Medicine.

* * *

Principal speaker at tuberculosis accreditation ceremonies at Lowell School in Brainerd on April 17 was **Dr. M. M. Williams,** superintendent and medical director of the state sanatorium at Ah-Gwah-Ching. The program consisted of accreditation of Crow Wing County in recognition of its progress in reducing rates of infection and deaths from tuberculosis. The accreditation was sponsored by the Minnesota State Medical Association, the Minnesota Department of Health and the Christmas Seal organization.

* * *

Dr. Wesley W. Spink, professor of medicine at the University of Minnesota, presented the annual address at a meeting of the Minneapolis Academy of Science in Minneapolis on May 4 and 5. The title of his talk was "Undulant Fever, an Example of the Interdependence of Research."

* * *

Dr. J. G. Love, Rochester, member of the neurologica surgery staff of the Mayo Clinic, presented a paper a the centennial celebration and scientific congress of the Hawaii Medical Association in Hawaii April 22 to 29 The title of the paper, which was written by Dr Love, **Dr. H. W. Dodge, Jr.,** and **Dr. C. M. Gottlieb** was "Benign Tumors of the Foramen Magnum."

* * *

Special award keys honoring former chairmen of th Ramsey County chapter of the National Foundation fo Infantile Paralysis were presented at a luncheon in St. Paul on April 12. Among those presented keys, plu fifteen-year pins for service to the national foundation were **Dr. Walter R. Ramsey, Dr. C. C. Chatterton** an **Dr. James Dunn,** all of St. Paul.

* * *

At a meeting of the six county Southwestern Minnesota Medical Society at Worthington on April 23, th

(Continued on Page A-30)

IMPORTANT RESEARCH CONTRIBUTION

Searle Introduces:

A Practical New Steroid for Protein Anabolism

Nilevar*

(BRAND OF NORETHANDROLONE)

PROTEOGENIC EFFECTIVENESS • The newest Searle Research development, Nilevar, exerts a potent force in protein anabolism. Yet it is without appreciable androgenic effect (approximately one-sixteenth of that exerted by the androgens).

Investigations with Nilevar show that nitrogen, potassium and phosphorus are retained in ratios indicating protein anabolism. Nilevar is thus the first steroid which is primarily anabolic and which provides a practical means of meeting the numerous demands for protein synthesis.

NILEVAR IS ORALLY EFFECTIVE • Clinical response to Nilevar is characterized not only by protein anabolism but also by an increase in appetite and an improved sense of well-being.

SAFETY AND PRECAUTIONS • Nilevar has an extremely low toxicity. Laboratory animals fail to show toxic effects after six months of continuous administration of high dosages. Nilevar should not be administered to patients with prostatic carcinoma. Nausea or edema may be encountered infrequently.

DOSAGE • The daily *adult* dose is three to five Nilevar tablets (30 to 50 mg.) but up to 100 mg. may be administered. For *children* the daily dose is 1 to 1.5 mg. per kilogram of body weight. Individual dosages depend on need and response to therapy. Nilevar is available in 10 mg. tablets. G. D. Searle & Co., Research in the Service of Medicine.

INDICATIONS:

Nilevar is indicated in the vast area of surgical, traumatic and disease states in which protein anabolism is desirable for hastening recovery. The specific indications are:

1. **Preparation for elective surgery.**
2. **Recovery from surgery.**
3. **Recovery from illness: pneumonia, poliomyelitis and the like.**
4. **Recovery from severe trauma or burns.**
5. **Nutritional care in wasting diseases such as carcinomatosis and tuberculosis.**
6. **Domiciliary care of decubitus ulcers.**
7. **Care of premature infants.**

*Trademark of G. D. Searle & Co.

SEARLE

Cleans like magic . . . no more scrubbing with

KLER-RO®

AN ULMER PRODUCT

For surgical instruments, laboratory glassware, rubber goods and linens.

Soaks clean . . . removes dried blood, pyrogens, plasma, serums and mucus . . . eliminates necessity of hand scrubbing.

Will not etch glassware, leaves it sparkling clear. Will not pit stainless steel. Has a nearly neutral pH. Kler-ro does not cake but dissolves quickly and is safe and economical to use.

Write for free sample and brochure today. . . . MM-656.

Physicians & Hospitals Supply Co.
1400 Harmon Place Minneapolis 3, Minn.

(Continued from Page 432)

principal speakers were **Dr. E. Harvey O'Phelan** and **Dr. W. R. Schmidt**, both of Minneapolis. Dr. O'Phelan spoke on "Fractures in Children," while Dr. Schmidt discussed "Chest Injuries."

* * *

Dr. John R. McDonald, Rochester, head of a section of surgical pathology in the Mayo Clinic, has been awarded the 1956 medal for Minnesota by the American Cancer Society. The award was for Dr. McDonald's research work in the early detection of cancer cells in various body fluids. He has been at Rochester since 1933, when he first became a fellow in pathology at the Mayo Foundation.

* * *

Speakers at the fourth annual Upper Midwest Business and Industrial Forum on Problem Drinking, held in Minneapolis on May 9, included **Dr. Nelson J. Bradley**, superintendent of Willmar State Hospital, Willmar, and **Dr. Robert L. Faucett**, Rochester.

* * *

Dr. Howard P. Rome, Rochester, head of psychiatry section at the Mayo Clinic and professor of psychiatry in the Mayo Clinic, was elected for a three-year term on the governing council of the American Psychiatric Association at the annual meeting of the organization in Chicago on April 30.

* * *

Dr. Frank M. Manson, retired Worthington physician, celebrated his eighty-fifth birthday on April 10 Dr. Manson began practice in Worthington in 1899 and started its first hospital in 1906. In 1939, due to severe radiation burns on his hands from long exposure to x-rays, Dr. Manson retired from active practice.

* * *

The Friedenwald Medal of the American Gastroenterological Association was awarded to **Dr. Donald C. Balfour**, Rochester, director emeritus of the Mayo Foundation, at the organization's annual meeting in Atlantic City, New Jersey, on April 28. The medal was created to honor outstanding contributions to knowledge in the field of gastroenterology.

* * *

Dr. Kathleen Jordan, Granite Falls, discussed tuberculin testing techniques on the "Doctor's Round Table" television show on May 6 over WCCO-TV, Minneapolis.

* * *

Dr. Gordon R. Kamman, St. Paul, and attorney **Charles Murnane** spoke on "Medical-Legal Relationships" at a joint meeting of the Lyon-Lincoln County Medical Society and the Lyon-Lincoln Bar Association at Marshall on May 7.

* * *

Dr. Waltman Walters, Rochester, head of a section of surgery at the Mayo Clinic, was formally invested with the rank of rear admiral in the United States Naval Reserve at ceremonies in Rochester on April 18.

V LOCATIONS

r. Robert D. Pilgrim has become associated in prac-ic with Dr. Silas W. Giere in Benson. A graduate of he University of Minnesota Medical School in 1954, D Pilgrim formerly practiced in Oakland, California.

r. Joseph W. Teynor and Dr. John R. Flanary have me associated with the Olmsted Medical Group in R hester. Dr. Flanary previously practiced in Mil-w kee, Wisconsin, while Dr. Teynor recently com-l d three years as a flight surgeon in the Navy.

M NESOTA BLUE CROSS-BLUE SHIELD

he number of Minnesotans enrolled in Blue Cross eded 1,037,000 persons as of March 31, 1956, com-p d to nearly 1,007,000 persons as of March 31, 1955, re esenting an increase of approximately 30,000.

he increase in enrollment was due for the most part tc n increase in group enrollment, an increase of 8,640 racts representing 26,905 participant subscribers.

ospitalization activity during the first quarter of 1956 r cts not only the gain in enrollment but also in-c ses in the incidence of hospitalization. During the fi three months of 1956, 279,625.2 days of hospital were provided for 44,991 participant subscribers, r esenting an increase of 27 cases and 142 days per y per 1,000 contracts protected.

he increased utilization was due for the most part to eases in respiratory illnesses, digestive and genito-u iary diseases . . . with respiratory illnesses the major r ion. Both medical and surgical (tonsillectomies) r piratories indicate an increase in rate of hospitaliza-of approximately eight cases per year per 1,000 c tracts protected.

ubscriber benefits increased nearly $900,000 between t two quarterly periods. This increase in benefits is c , however, not only to the increase in the number of c s paid, but also to the steady trend of subscribers chasing more inclusive hospital service benefits.

Vith Blue Shield's enrollment nine per cent greater a he end of the first quarter of 1956 than it was at the e of the first quarter in 1955, both the number of c ms paid and the amount Blue Shield paid doctors f subscribers' care during the first quarter of 1956 were proximately 20 per cent greater than during the first rter of 1955.

Blue Shield as of March 31, 1956 had 747,142 par-t pant subscribers enrolled, and as of March 31, 1955, e Shield's enrollment totaled 682,953 participant sub-bers. This represents approximately a nine per cent rease in enrollment between these two dates.

During the first quarter of 1956, Blue Shield paid 152 claims for subscribers' medical, surgical and ob-rical care. This figure is 6,477 greater or approxi-tely 20 per cent more than the number of claims for scribers' care paid to physicians during the first rter of 1955.

During the first quarter of 1956, physicians received 646,483 for services rendered Blue Shield subscribers. is amount represents approximately a 20 per cent in-ase over the amount paid physicians for subscribers' e during the first quarter of 1955, which amount was 371,668.

the choice of doctors . . .

WHO DEMAND THE BEST

P&H TREATMENT TABLE

- Upholstered in Naugahyde covering
- Modern design and sturdy construction
- Legs of 1 inch chrome plated steel tubing

This modern table has been designed especially for P&H. It is modern in trend and sturdy in construction. 72" long, it accommodates all patients. The legs are made of 1" steel tubing, triple plated with copper, nickel and chrome. The top is well padded and covered with Naugahyde. Overall dimensions are: 72" long, 26" wide and 30" high. Write for complete information and price . . . MM-656a.

Physicians & Hospitals Supply Co.

1400 Harmon Place Minneapolis 3, Minn.

WE CORDIALLY INVITE YOUR INQUIRY for application for membership which affords protection against loss of income from accident and sickness as well as benefits for hospital expenses for you and all your eligible dependents.

APH OMAHA
APC OMAHA
the Emblems of RELIABLE PROTECTION

SINCE
1902

ALL PREMIUMS COME FROM

PHYSICIANS
SURGEONS
DENTISTS

ALL BENEFITS GO TO

$4,500,000 ASSETS
$23,800,000 PAID FOR BENEFITS
SINCE ORGANIZATION

PHYSICIANS CASUALTY
AND
HEALTH ASSOCIATIONS
OMAHA 2, NEBRASKA

Book Reviews

Books listed here become the property of the Ramsey Hennepin and St. Louis County Medical Libraries whe reviewed. Members, however, are urged to write re views of any or every recent book which may be o interest to physicians.

BOOKS RECEIVED FOR REVIEW

MASS CASUALTIES. Principles Involved in Man - ment. Reprinted from Military Medicine, A , 1956. Papers delivered at 62nd Annual Conven of the Association of Military Surgeons of the Un States at Washington, D. C., November 7-9, 1 Illus. Price $1.50, paper cover. Washington, D. Assn of. Military Surgeons, 1956.

THERAPY OF FUNGUS DISEASES. An Internati l Symposium. Edited by Thomas H. Sternberg, M , Professor of Medicine (Dermatology) and Assis t Dean for Postgraduate Medical Education; and - tor D. Newcomer, M.D., Associate Professor of M - cine (Dermatology). 337 pages. Illus. Price $, cloth. Boston: Little, Brown & Co., 1955.

THE MENNINGER STORY. Walker Winslow. pages. Illus. Price $5.00, cloth. Garden City, N. Doubleday & Co., 1956.

BELLEVUE IS MY HOME. Salvatore R. Cut , M.D., with Arthur and Barbara Belg. 317 pa . Price $4.00, cloth. Garden City, N. Y.: Double y & Co., 1956.

HUNTERDON MEDICAL CENTER. Ray E. Trus l, M.D., M.P.H. Formerly served as Director of e Hunterdon Medical Center. Now Executive Off r of the Columbia University School of Public He h and Administrative Medicine. 236 pages. Price $3 . Cloth. Cambridge, Massachusetts: Harvard Uni - sity Press, 1956.

THE DOCTORS. Andre Soubiran. 380 pages. P e 50c, paper. New York: Popular Library, Inc., 1 .

RADIOISOTOPES IN MEDICINE. Gould A. - drews, Marshall Brucer and Elizabeth B. Ander , editors. 817 pages. Price, $5.50, paper cover. W - ington 25, D. C.: U. S. Government Printing Of , 1956.

The U. S. Atomic Energy Commission has just iss d "Radioisotopes in Medicine," which is the complete - ceedings of a special course on the subject condu d by the Oak Ridge Institute of Nuclear Studies in - tember, 1953.

The book contains forty-eight chapters, divided o nine main sections, complete with bibliography, in , charts, and illustrations.

Lecturers in the course, whose discussions are - sented in the book, included outstanding authoriti n the fields of medicine and radioisotopes from thro - out the United States. Contents of the book inc e papers concerning availability and uses of isotopes, p - lems in radiation, radiation measurement and do - etry, tumor localization, diagnostic and therapeutic s of radioiodine, metabolic and vascular studies, isot i the study and treatment of hematologic disorders, rapy with radioactive colloids, and therapy with exnal and implanted sources.

IE CHANGING YEARS. By Madeline Gray. 207 pages. Cloth, $2.75. Garden City, New York: Doubleday & Company, Inc., 1951.

This publication is a factual presentation of the probns confronting the menopausal woman. The author s acquainted herself with the pertinent information reing to her subject by seeking out authorities in the ds of obstetrics and gynecology, endocrinology, psyatry, general medicine, and religion. An excellent exsive author and subject index and bibliography attest the effort made to make this book a comprehensive view of the subject. The language of the book is ily understood and the method of presentation makes enjoyable reading. The understanding manner in ich the author has approached her material makes it valuable medium for lay education.

The opening chapters introduce the subject through e author's personal experience as she confronts her rgical menopause—supplied with only a meager ount of factual information, considerable superstition, d given scant support and reassurance by her attendg physician. The physiology of menstruation and asciated endocrine functions and fluctuations from berty through the menopause are discussed. Menousal symptoms are taken individually and a rational explanation of their significance, cause and effect are elucidated. Superstitions and facts as related to these subjects are thoroughly discussed and dispelled, especially those dealing with mental disease, cancer, hypertension, arthritis and others. Hormone therapy of the menopause utilizing estrogens and/or androgens is outlined. The efficacy, convenience and low cost of the oral hormone preparations as compared with the parenterally administered forms are stressed.

The chapters devoted to the discussions of the conflicting attitudes of early training as related to sex, religion and sex, love and the marital relationship after forty, maintaining a trim figure and an interest in life experiences at this time should stimulate the reader to a better understanding of and adjustment to her problems. A section devoted to the male menopause brings out physiological differences between the male and female and should assist in developing an understanding of the individual problems of each sex.

The importance of a satisfactory patient-doctor relationship and the salutary effects of adequate medical treatment, hormone and/or supportive, is clearly outlined. The physician who daily sees women in the menopausal age group could profit greatly from reading this book. The author gives a patient's eyeview of problems encountered during these changing years and points out areas in which a physician frequently is remiss in fulfilling the patient's needs.

KENNETH W. TEICH, M.D.

Upjohn
KALAMAZOO

Indicated in most conditions in which oral cortisone or hydrocortisone is effective. Available in 2.5 mg. tablets in bottles of 100, and in 5 mg. tablets in bottles of 30, 100, and 500. Usual dosage is ½ to 1 tablet three or four times daily

Deltasone*

Less sodium retention, less potassium depletion

*Trademark for the Upjohn brand of prednisone (delta-I-cortisone)

EVERY WOMAN WHO SUFFERS IN THE MENOPAUSE DESERVES "PREMARIN"®

widely used natural, oral estrogen

AYERST LABORATORIES
New York, N. Y. • Montreal, Canada
5646

CURRENT CONCEPTS IN DIGITALIS THERAPY

Bernard Lown and Samuel A. Levine. 164 page
Price, $3.50. Boston: Little, Brown & Company, 195

The extensive experience and experimentations c the authors make this little book both valuable an informative. Long-established and current concepts regarding the action and clinical use of digitalis, its toxicity, and its relation to electrolytes, are discussed. Illus trative electrocardiograms are appropriately placec Finally, a digitalis tolerance test is described. An e cellent bibliography is appended, and the monograp is well indexed.

This book definitely merits a careful reading by a physicians who treat heart disease.

Robert J. Goldish, M.I

NEW FILM ON NON-MEDICAL HOSPITAL CARE

A new film, *The Patient Is a Person (Hospital Care* has just been made available by the Smart Famil Foundation as a public service to physicians, medical o ganizations, and hospitals at a nominal cost. The fil explores the fearful attitudes which many patients e hibit on entering the hospital, and suggests techniques non-medical care which may help to allay these fea and contribute to the patient's rapid recovery. It stress the ways in which physicians, the admitting clerk, nurse volunteers, administrative help and housekeepers ca maintain the patient's confidence in the hospital tea and fill his needs as a person.

The Patient Is a Person is presented as a public serv ice by the Smart Family Foundation in co-operation wit the American Medical Association and the America Hospital Association. A 16mm sound motion picture i color, 20 minutes running time, *The Patient Is a Perso* may be purchased for $50 in color or $10 in black an white from either of the above mentioned organization The film may also be rented from these two groups.

HOMER M. McINTIRE

(Continued from Page 429)

and Park College at Parkville, Missouri. He graduate from Rush Medical College in 1913 and interned at S Joseph's Hospital, Chicago.

Dr. McIntire was associated with the More Hospita Eveleth, Minnesota, for four years and spent one year a surgeon at the Steptoe Valley Hospital at Ely, Nevad He began general practice at Waseca in 1919.

A member of the Waseca County Medical Society, h was also a member of the Southern Minnesota Medic Association, the Minnesota State Medical Associatio and the American Medical Association.

He belonged to the Waseca Shrine club Zuhra Shrine, Tuscan Lodge AF&AM and was a member Nu Sigma Nu fraternity.

Survivors include his wife, Eileen; one daughter, Mr R. D. Jungman, La Mesa, California, and one so Homer M., Osage, Iowa. One son, John Dyer, died i infancy. He is also survived by a brother, W. A. M Intire, Seamen, Ohio.

HELP FOR PROBLEM DRINKERS *

* The Problem Drinker is one whose drinking causes a continuing and growing problem in any department of his life.

IF YOU HAVE PATIENTS IN THIS CATEGORY . . . . INVESTIGATE!

Hazelden is a non-profit organization, designed to help problem drinkers return to normal living. Its peaceful country setting is on beautiful Lake Chisago, near Center City, 45 miles northeast of the Twin Cities, with spacious grounds, suitable and well-equipped buildings. Hazelden is secluded, yet within easy reach of U. S. Highway 8.

Your Inspection Is Invited.
Complete Information on Request.

Director
LYNN CARROLL

Affiliated with St. Croix Memorial Hospital
MEDICAL STAFF
Fred B. Reigel, M.D., *Chief of Staff*
J. C. Belshe, M.D., *Asst. Chief of Staff*
Norwood E. Wegner, M.D.

Hazelden

Twin Cities Office
341 North Dale Street - Saint Paul, Minn.

24 Hour Telephone—CApital 7-6397

A Complete Orthopedic Fitting Service

PRESCRIPTION SERVICE BY CERTIFIED FITTERS AT
HOSPITAL—OFFICE—HOME

ORTHOPEDIC APPLIANCE & LIMB MANUFACTURERS ASSN.
MEMBER

Camp Supports,
Identical Form Breasts,
Orthopedic Shoes,
Artificial Limbs,
Arms, Braces

AMERICAN BOARD FOR CERTIFICATION
CERTIFIED

For Men, Women and Children

RAY TRAUTMAN AND SON

410 Portland
FE 2-2339
Minneapolis 15, Minn.

We will be in Booth No. 73 at Rochester.

Brown & Day, Inc.

Your Patients Deserve

The Finest

FOLDING WHEEL CHAIRS

and

WALKERS

—and that means

Everest and Jennings

Made for greatest comfort, dependability and riding ease—fully guaranteed.

Let Us Send You An Illustrated Catalog

"Everything for the Physician"

for fast service call CA 2-1845

SERVICE BROWN & DAY INC. SAINT PAUL U.S.A. QUALITY

62-64 EAST 5TH ST
St. Paul 1, Minn.

NEW!
Patented HANSEN Split Frame Truss

Positive Hernia Control

Contoured Spring Design Gives
Custom Made Comfort
Unlimited Body Activity

Single with Dummy Illustrated
Double not Illustrated

C. F. ANDERSON CO., INC.

901 Marquette
Minneapolis, Minnesota

*"...THE MERCURIALS HAVE PROLONGED THE WORKING PERIOD AND LIFE SPAN OF COUNTLESS SUFFERERS FROM CONGESTIVE HEART FAILURE..."**

TABLET
NEOHYDRIN®

*Fishberg, A. M.: Hypertension and Nephritis, ed. 5, Philadelphia, Lea & Febiger, 1954, pp. 177-178.

00756

Invest in the Future Of Your Country...

Buy

U. S. Savings Bonds

"Safe as America"

Cook County Graduate School of Medicine
INTENSIVE POSTGRADUATE COURSES
STARTING DATES—SUMMER & FALL, 1956

SURGERY—Surgical Technic, two weeks, July 23, August 6
Surgical Anatomy and Clinical Surgery, two weeks, September 24
Surgery of Colon and Rectum, one week, September 17
General Surgery, two weeks, September 10
Thoracic Surgery, one week, October 1
Esophageal Surgery, one week, September 24
Breast and Thyroid Surgery, one week, October 22
Fractures and Traumatic Surgery, two weeks, October 15
GYNECOLOGY AND
OBSTETRICS — Obstetrics and Gynecology, three weeks, October 22
Office and Operative Gynecology, two weeks, September 17
Vaginal Approach to Pelvic Surgery, one week, September 10
MEDICINE—Electrocardiography and Heart Disease, two-week basic course, July 9
Internal Medicine, two weeks, September 24
Gastroscopy and Gastroenterology, two weeks, September 10
Gastroenterology, two weeks, October 22
Dermatology, two weeks, October 15
RADIOLOGY—Diagnostic X-ray, two weeks, September 17
Clinical Uses of Radioisotopes, two weeks, October 8
UROLOGY—Two-week Course, October 8
Cystoscopy, ten days, by appointment

TEACHING FACULTY—ATTENDING
STAFF OF COOK COUNTY HOSPITAL

ADDRESS: REGISTRAR, 707 South Wood Street,
Chicago 12, Illinois

specify

Lederle

**POLIOMYELITIS
IMMUNE GLOBULIN**
(human)

For the modification of measles and the prevention or attenuation of infectious hepatitis and poliomyelitis.

LEDERLE LABORATORIES DIVISION
AMERICAN Cyanamid COMPANY
PEARL RIVER, NEW YORK

**Relax the best way
... pause for Coke**

DRINK
Coca-Cola
Work
Refreshed

**continuous quality
is quality you trust**

DRINK
Coca-Cola
REG. U.S. PAT. OFF.

The Birches Sanitarium, Inc.

2391 Woodland Avenue
Duluth 3, Minnesota

A hospital for the care and treatment of Nervous and Mental disorders. Quiet, cheerful environment. Specially trained personnel. Recreational and occupational therapy.

Dr. L. R. Gowan, M.D., M.S., Medical Director

GYNECOLOGIC CYTOLOGY SERVICE

Interpretation of Cervico-Vaginal, Etc.
(Papanicolaou) Smears
for the
Diagnosis of Carcinoma
Kits (Slides, Spatulas, Fixative and Mailing Containers)
and
Instructions for Taking and Mailing Smears furnished on request

M. WM. RUBENSTEIN, M.D.
GYNE-CYTOLOGY LABORATORY
636 Church Street, Room 517 Evanston, Illinois

Patronize

MINNESOTA MEDICINE

Advertisers

THE BANK WHERE YOU FEEL AT HOME

the AMERICAN
NATIONAL BANK OF SAINT PAUL
MEMBER FEDERAL DEPOSIT INSURANCE CORPORATION

RADIUM RENTAL SERVICE

4340 CEDARWOOD ROAD
MINNEAPOLIS 5, MINNESOTA
TEL. FE 3-5297

Radium element prepared in type of applicator requested

ORDER BY TELEPHONE OR MAIL
PRICES ON REQUEST

DANIELSON MEDICAL ARTS PHARMACY, INC.

10-14 Arcade, Medical Arts Building
825 Nicollet Avenue—Two Entrances—78 South Ninth Street
MINNEAPOLIS

PHONES:
FEderal 3-3317
FEderal 3-3318

HOURS:
WEEK DAYS—8 to 7
SUN. & HOL.—10 to 1

Insurance at a Saving

Druggists' Mutual Insurance Company
OF IOWA, ALGONA, IOWA

Fire - Tornado - Automobile Insurance

Prompt Loss Service

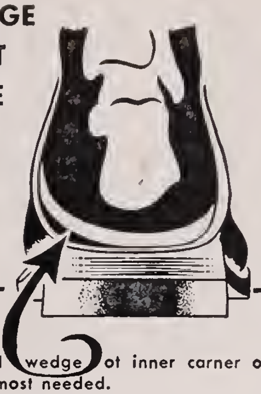
MINNESOTA REPRESENTATIVE—S. E. STRUBLE, WYOMING, MINN.

"...WHEN CONTINUOUS DIURESIS IS MANDATORY TO CONTROL HEART FAILURE, NEOHYDRIN BECOMES THE SUPERIOR [ORAL] AGENT, SINCE THIS COMPOUND CONTINUES TO PRODUCE DIURESIS WHEN ADMINISTERED DAILY"*

*Moyer, J. H., and Hughes, W. M.:
J. Chron. Dis. 2:678, 1955.

00656

PATENTED WEDGE GIVES SUPPORT TO CENTER LINE OF BODY WEIGHT ★



★ Insole extension and wedge at inner corner of heel where support is most needed.

- The patented arch support construction is guaranteed not to break down.
- Innersoles guaranteed not to crack or collapse.
- Foot-so-Port lasts designed and the shoe construction engineered with orthopedic advice.
- Conductive Shoes for surgical and operating room personnel. N.B.F.U. specifications.
- We are also the manufacturer of the Geor-Action Shoe designed by noted orthopedic surgeon.
- We make more shoes for polio, club feet and disabled feet than any other shoe manufacturer.

Send for free booklet, "The Preservation of the Function of the Foot Balancing and Synchronizing the Shoe with the Foot."

Write for details or contact your local **FOOT-SO-PORT** *Shoe Agency. Refer to your Classified Directory*

Foot-so-Port Shoe Company, Oconomowoc, Wis.
A Division of Musebeck Shoe Company

GLYCAMINE®
TABLETS

For Peptic Ulcers and Hyperacidity

Available All Drug Stores

Distributed by
DALCO PHARMACAL CO.
Minneapolis, Minnesota

THE
MEDICAL PROTECTIVE
COMPANY
FORT WAYNE, INDIANA

unique
in successfully fighting
malpractice charges

PROFESSIONAL PROTECTION
EXCLUSIVELY
SINCE 1899

MINNEAPOLIS Office:
Robert L. McFerran and
John Hansel, Representatives
311 East 24th St., Apt. A-1
Telephone Federal 9-1292

ARTIFICIAL LIMBS
ORTHOPEDIC APPLIANCES
TRUSSES
SUPPORTERS
ELASTIC HOSIERY

FREJKA
Abduction Pillow Splint
by the
Original Maker

For displasia of the hip in the newborn and in early postnatal life (as described by Dr. V. L. Hart, Journal of Bone and Joint Surgery, Vol. 31-A, pp 357-372, April, 1949)

Prompt, painstaking service

BUCHSTEIN-MEDCALF CO.
223 So. 6th Street Minneapolis 2, Minn.

Classified Advertising

Replies to advertisements with key numbers should be mailed in care of Minnesota Medicine *2642 University Avenue, Saint Paul 14, Minnesota.*

AVAILABLE FOR LOCUM TENENS in general practice July 10 to August 31, 1956. Kermit J. Halverson, M.D., 34 Williams Ave. S.E., Minneapolis 14, Minnesota, until July 1, 1956.

AVAILABLE FOR LOCUM TENENS, two weeks, during July, August or September. Physician with general medical experience, now in pediatric training, wishes either general or pediatrics practice. Address E-537, care Minnesota Medicine.

WANTED: Locum Tenens for any part of summer or fall months with group of fifteen general practitioners and specialists. Modern facilities. East Range Clinic, Virginia, Minnesota.

WANTED—General practitioner for State Hospital. Salary range $641 to $781 per month. Quarters available, subsistence, laundry, and garage. Government working conditions, paid holidays, vacation, sick leave, and retirement pension plan. Write Superintendent, Fergus Falls State Hospital, Fergus Falls, Minnesota.

WANTED—General practitioner to associate with group in Northern Minnesota in heart of new iron ore development. Rapidly enlarging population. Partnership after one year. Contact: D. J. Richter, M.D., East Range Clinic, Virginia, Minnesota.

WANTED—Board-certified or board-elegible ophthalmologist. Group of thirteen doctors in small midwest community. Liberal starting salary and partnership after one year. Address E-525, care Minnesota Medicine.

WANTED—Associate in general practice. Excellent office, housing, schools, and hospital facilities. Early partnership. Twenty-five miles northwest of Minneapolis. R. D. Thielen, M.D., St. Michael, Minnesota.

WANTED—Assistant or associate in general practice, by two associated general practitioners in prosperous central Minnesota town. New hospital and excellent facilities. Prefer associate with some special training or experience. Please state qualifications and ambitions in application. Write E-522, care of Minnesota Medicine.

WANTED—Physician interested in general practice in small city with full hospital facilities and to be associated with small group. Address E-535, care Minnesota Medicine.

WANTED—Young general practitioner, desirably with some training in internal medicine or gynecology, to join general surgeon. Excellent working conditions. Town 5000, one hour's drive to Twin Cities. New hospital, industry, golf, fishing, resort, etc. Partnership available. Address E-532, care Minnesota Medicine.

PLACEMENT SERVICE

The Minnesota State Medical Association maintains a Medical Placement Service for the benefit of physicians who are looking for locations and positions; also for communities, medical groups and physicians who are looking for licensed medical assistance. For information, write to the Minnesota State Medical Association, 496 Lowry Medical Arts Bldg., Saint Paul 2, Minnesota.

LARGE NATIONALLY KNOWN INDUSTRIAL CONCERN has opening for general practitioner, recent medical graduate, or one desiring to enter th industrial field. Complete modern Medical Department, no Saturday or Sunday work, paid holidays vacations, sick leave, and pension plan. Fine opportunity for right man in town of 18,000, near Twin Cities. Address E-531, care Minnesota Medicine

WANTED—Physician interested in Internal Medicine New ultra-modern 100-bed GM&S hospital. Modern 2-bedroom apartment available at nominal rent. Salary range from $8,990 to $14,000 depending upon qualifications. Our Chiefs of Medicine and Surgery are both Board men. Apply M. J. Robertson, M.D Manager, Veterans Administration Hospital, Miles City, Montana

WANTED—X-ray technician in doctor's office. Knowledge of typing desired. Address E-534, care Minnesota Medicine.

MEDICAL TECHNICIAN WANTED—Woman graduate to join Clinic staff starting June 1. Working hours —Monday through Saturday noon, with one-half day off each week plus paid vacations. Salary open, depending upon experience. New building. Owatonna Clinic, 111 West Main Street, Owatonna, Minnesota

FOR RENT: Office space for physician, 22nd and Johnson, N.E., Minneapolis. Ideal for young doctor with limited capital. Telephone Sterling 1-4565, or inquire Ken's Pharmacy, same location.

DOCTOR OR DENTIST—Beautiful suite in South Minneapolis. Very modern. Six months free rent. Then option of lease at very reasonable rent. Wm. L Cochrane, 4101 - 42nd Avenue South, Minneapolis Minnesota. Telephone Ro 9-8758.

FOR RENT—Highland Shopping Area, equipped office available, full or part time. Share with surgeon an dentist. Excellent for general practice, obstetrics pediatrics. No equipment necessary; no rent unt established. H. Schwyzer, M.D., 2069 Ford Parkway Saint Paul. Telephone: MI 8-4832 or CA 4-7416

GROUND FLOOR OFFICE FOR RENT—Three room and reception room to be shared with a dentist and M.D. Ideal for pediatrician or general practitioner Located in Southern Minnesota county seat of 30,000 Write P.O. Box 266, Austin, Minnesota.

ATTENTION DENTISTS AND DOCTORS—Modern space available for dentists' and doctors' offices. A location where several sets of doctors and dentists have been long established and then built their own clinics. A money maker. Above Kisch's Food Market. Plenty of auto parking space. Apply 637 Stryker Avenue, Saint Paul, Minnesota.

FOR RENT OR SALE—Eight-room, first-floor physician's office. Well equipped. Near Twin Cities. Gross over $30,000. New hospital—unlimited privileges. Good opportunity. Write E-511, care MINNESOTA MEDICINE.

FOR SALE—Birtcher Vibra bath, hydro-massage power unit. Suitable for whirlpool treatment in hospital, home or athletic department. Good condition. Price $150.00. Contact Donald Erickson, 3101 University Avenue, S.E., Minneapolis, Minnesota. Telephone FEderal 6-9353.

FOR SALE—General practice in county seat town, central Minnesota. Gross over $40,000 annually. Practice, records, equipment, drugs, and accounts, $20,000. Address E-530, care MINNESOTA MEDICINE.

FOR SALE—General practice, established 30 years. Gross over $45,000. Easy terms. New building and equipment. Prosperous community, central Minnesota. Excellent hospital facilities. Will introduce. Address E-533, care MINNESOTA MEDICINE.

FOR SALE: Ophthalmological practice of the late Dr. R. R. Tracht, Saint Paul, Minnesota. For particulars address E-536, care MINNESOTA MEDICINE.

FOR SALE—Physician's furniture and equipment. First class shape. Very reasonable. Retiring. Address E-538, care MINNESOTA MEDICINE.

Index to Advertisers

Aloe, A. S., Co. A-22
American National Bank of Saint Paul A-38
Ames Co., Inc. .... Cover III
Anderson, C. F., Co., Inc. A-36
Ayerst Laboratories A-34

Baker Laboratories, Inc. A-18
Benson Optical Co. A-24
Birches Sanitarium A-38
Breon, Geo. A., & Co. A-16
Brown & Day, Inc. A-36
Buchstein-Medcalf Co. A-39
Burroughs Wellcome & Co. A-4

Caswell-Ross Agency 388-A
Ciba A-42
Classified Advertising A-40, A-41
Coca-Cola A-37
Cook County Graduate School of Medicine A-37
Corn Products Refining Co. A-10

Dalco Pharmacal Co. 388-D, A-39
Danielson Medical Arts Pharmacy A-38
Druggists' Mutual Insurance Co. A-38

Foot-so-Port Shoe Co. A-39

General Electric A-12
Gyne-Cytology Laboratory A-38

Hazelden Foundation A-35
Hoffmann-La Roche .... Facing page A-4

Juran & Moody A-5

Lakeside Laboratories (Neodydrin) A-19, A-36, A-39
Lederle Laboratories 388-B, 388-C, A-37
Lilly, Eli, & Co. .... Cover I, A-28

Medical Protective Co. A-39

Parke, Davis & Co. .... Cover II, A-1
Pfizer Laboratories A-11, A-21
Physicians Casualty & Health Associations A-32
Physicians & Hospitals Supply Co. A-30, A-31

Radium Rental Service A-38
Riker Laboratories A-23

St. Croixdale Sanitarium A-42
St. Paul Fire & Marine Insurance Co. A-22
Schering Corporation .... A-7, facing page A-12, A-26, A-27
Searle, G. D., & Co. A-29
Sharp & Dohme A-15
Smith, Kline & French Laboratories .... A-14, Cover IV
Squibb A-13, A-20
Sutliff & Case Co., Inc. A-24

Trautman, Ray, and Son A-35

Upjohn A-33

Viceroy Cigarettes A-8

Wallace Laboratories A-17
Winthrop Laboratories A-6
Wyeth A-9, A-25

for a spastic
GUT

Trasentine®-Phenobarbital

integrated relief . . .
mild sedation
visceral spasmolysis
mucosal analgesia

TABLETS *(yellow, coated), each containing 50 mg. Trasentine® hydrochloride (adiphenine hydrochloride CIBA) and 20 mg. phenobarbital.*

C I B A
Summit, N. J.

8/2229M

A MODERN
PRIVATE
SANITARIUM

for the
Diagnosis, Care
and Treatment
of Nervous
and Mental
Disorders

MAIN BUILDING—One of 10 Units in "Cottage Plan"

ST. CROIXDALE ON LAKE ST. CROIX

PRESCOTT, WISCONSIN

Located on beautiful Lake St. Croix, 18 miles from the Twin Cities, it has the advantages of both City and Country. Every facility for treatment provided, including recreational activities and occupational-therapy under trained personnel. Close personal supervision given patients, and modern methods of therapy employed. Inspection and cooperation by reputable physicians invited. Rates very reasonable. Illustrated folder on request.

Prescott Office
Prescott, Wisconsin
Howard J. Laney, M.D.
Tel. 39 and Res., 76

Consulting Neuro-Psychiatrists
Hewitt B. Hannah, M.D., Andrew J. Leemhuis, M.D.
527 Medical Arts Bldg., Tel. FE. 2-1357, Minneapolis, Minn.

Superintendent
Ella M. Leseman
Prescott, Wisconsin
Tel. 69

NEW CONCEPT IN URINE-SUGAR TESTING

CLINISTIX

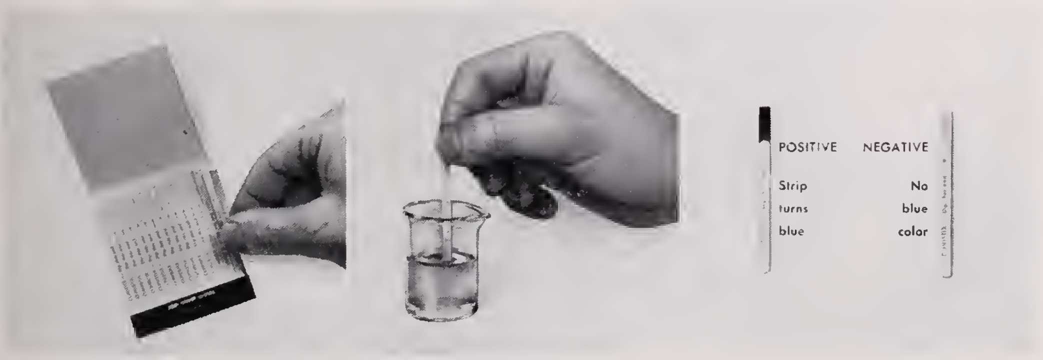
TRADEMARK

REAGENT STRIPS

specific enzyme test for urine glucose

REPORT TO PHYSICIAN
CLINISTIX
Specific test for urine glucose (sugar)
KEEP DRY
No. 2830
AMES COMPANY, INC.
KEEP COVER CLOSED
CLINISTIX — Dip this end

just dip
and read


POSITIVE
NEGATIVE
Strip
turns
blue
No
blue
color

complete specificity... unaffected by non-glucose reducing substances... differentiates glucose from other urine-sugars... thousands of tests reveal no substance causing a false positive.

extreme sensitivity... detects glucose concentrations of 0.1% or less.

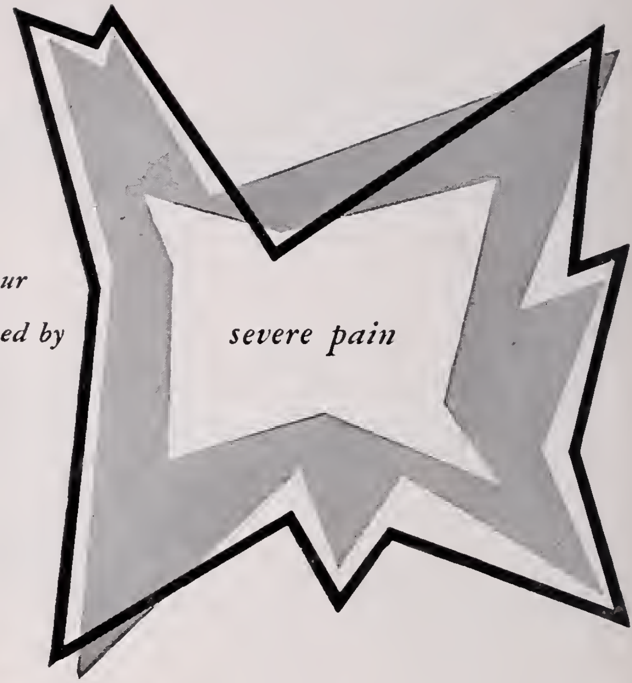
utmost simplicity and convenience... a CLINISTIX Reagent Strip moistened with urine turns blue when glucose is present.

qualitative accuracy... used whenever presence or absence of glucose must be determined rapidly and frequently. CLINISTIX does not attempt to give quantitative results because so many factors in urine influence enzyme reactions.

economy... CLINISTIX saves time and cuts costs... each strip is a complete test rapidly performed without reagents and equipment.

available: Pockets of 30 CLINISTIX Reagent Strips in cartons of 12—No. 2830.

AMES COMPANY, INC • ELKHART, INDIANA
Ames Company of Canada, Ltd., Toronto
13356



THORAZINE* *can help your patients to endure the suffering caused by* *severe pain*

for example: ***in burns***

Thorazine's unique tranquilizing action can reduce the suffering caused by the pain of severe burns. 'Thorazine' acts, not by eliminating the pain, but by altering the patient's reaction—enabling him to view his pain with what has been described as "serene detachment." Karp et al.,[1] reporting on the use of 'Thorazine' in patients with severe pain, observed that 'Thorazine' produced "a quiet, phlegmatic acceptance of pain."

'Thorazine' should be administered discriminately and, before prescribing, the physician should be fully conversant with the available literature.

'Thorazine' is available in ampuls, tablets and syrup (as the hydrochloride), and in suppositories (as the base).

Smith, Kline & French Laboratories, Philadelphia

*T.M. Reg. U.S. Pat. Off. for chlorpromazine, S.K.F.

1. Karp, M., et al.: Am. J. Obst. & Gynec. 69:780 (April) 1955.

Northern Minnesota Medical Association, Alexandria, September 7 and 8, 1956

Minnesota MEDICINE

COLLEGE OF PHYSICIANS
LIBRARY
SEP 24 1956
OF PHILADELPHIA

PUBLISHED MONTHLY BY THE MINNESOTA STATE MEDICAL ASSOCIATION

Volume 39 JULY, 1956 Number 7

Printed in U.S.A. (Table of Contents—Pages A-2 and A-3) 40c a copy—$3.00 a year

FOR THOSE WHO DEVELOP
NASAL CONGESTION
ON RESERPINE THERAPY

'Sandril' c̄ 'Pyronil'
(RESERPINE, LILLY) (PYRROBUTAMINE, LILLY)

About 50% of all patients experience this annoying side-effect. 'Sandril' c̄ 'Pyronil' relieves 75% of those affected.

Each tablet combines 0.25 mg. 'Sandril' and 7.5 mg. 'Pyronil.'

Lilly

571075

the logical drug

to use first[1]

for petit mal epilepsy

MILONTIN®

(phensuximide, Parke-Davis)

KAPSEALS® and SUSPENSION

five years of study confirm[2]

- effective in the petit mal triad
- one of the least toxic of all anti-epileptic drugs
- well tolerated

In patients with mixed grand mal—petit mal epilepsy, drug compatibility permits use of MILONTIN with Dilantin® Sodium (diphenylhydantoin sodium, Parke-Davis) or with Dilantin Sodium with Phenobarbital.

MILONTIN Kapseals, 0.5 Gm., bottles of 100 and 1,000; also available as MILONTIN Suspension (250 mg. per 4 cc.) in 16-ounce bottles.
Detailed information upon request, or from your Parke-Davis representative.

1. Davidson, D. T., Jr.; Lombroso, C., & Markham, C. H.: *New England J. Med.* 253:173, 1955.
2. Zimmerman, F. T.: *New York J. Med.* 55:2338, 1955.

MEDICAMENTA VERA

PARKE, DAVIS & COMPANY DETROIT, MICHIGAN

50028

Volume 39
Number 7

Minnesot

Contents fr

SCIENTIFIC ARTICLES

ORIGINAL CONTRIBUTIONS

New Techniques in Cholecystography.
L. Henry Garland, M.B., B.Ch., San Francisco, California 433

Posttraumatic Intraocular Hemorrhage.
F. G. Folken, M.D., Albert Lea, Minnesota 440

Metastatic Neoplasms of the Penis—Review of the Literature and Report of Two Cases.
M. P. Reiser, M.D., and *C. D. Creevy, M.D.*, Minneapolis, Minnesota 444

Familial Absence of Mesenteric Plexus as a Cause of Bowel Obstruction in the Newborn.
Eldon Berglund, M.D., *Willis H. Thompson, M.D.*, and *Tague C. Chisholm, M.D.*, Minneapolis, Minnesota 447

Harmful Effects of Interpretive Psychotherapy in Certain Involutional Depressions.
Gordon R. Kamman, M.D., Saint Paul, Minnesota.... 451

ACTH and Cortisone in Agranulocytosis.
J. S. Blumenthal, M.D., Minneapolis, Minnesota........ 454

Minnesota Automotive Crash Injury Research Program.
A. B. Rosenfield, M.D., Minneapolis, Minnesota........ 457

Medicatio Inhalatiorum.
Maurice S. Segal, M.D., Boston, Massachusetts..

Congenital Hemihypertrophy and Hemihypoplasia.
Dorrance Bowers, M.D., Rochester, Minnesota......

CASE PRESENTATIONS

Bronchogenic Carcinoma with Unusual Presenting Symptoms.
Richard F. Kline, M.D., Minneapolis, Minnesota. .

Traumatic Pancreatitis with Reference to the Abetti
Influence of Pancreatic Stimuli.
Thomas O. Murphy, M.D., and *C. Walton Lilleh*
M.D., Minneapolis, Minnesota..........

SEMINAR

The Pyrrol Pigments and Hemoglobin Catabolism.
(Concluded from June Issue)
C. J. Watson, M.D., Minneapolis, Minnesota.....

CURRENT CARDIAC CONCEPTS

Peripheral Arterial Embolism.
Frederick M. Owens, Jr., M.D., Saint Paul, Minr
sota ....

CONTINUATION STUDIES

Dysphagia.
Graham G. Smith, M.D., Minneapolis, Minnesota. 4

Official Journal of

Duluth Surgical Society
Minneapolis Academy of Medicine
Minneapolis Obstetrical and Gynecological Society
Minneapolis Surgical Society
Minnesota Academy of Medicine
Minnesota Obstetric and Gynecologic Society

Owner and Publisher

Published by MINNESOTA STATE MEDICAL ASSOCIATION
496 Lowry Medical Arts Building
St. Paul 2, Minnesota

Editing and Publishing Committee

E. M. Hammes, M.D.
Chairman, Saint Paul

F. M. Owens, Jr., M.D.
Saint Paul

F. A. Peppard, M.D.
Minneapolis

Henry Ulrich, M.D.
Minneapolis

Business Manager

R. R. Rosell
496 Lowry Medical Arts Building
St. Paul 2, Minnesota

GEN

Authors

Manuscripts should be addressed to Arthur H. Wells, M.D., Editor, 915 Eas Street, Duluth 5, Minnesota. Telephone RA 7-6636 or JA 5-2319. Original papers p for publication solely in Minnesota Medicine will be considered by the Board of providing they fulfill the following editorial standards. Manuscripts should be double spaced on white paper with at least 1-inch margins. The original (not a copy) is requested. The title on the first page should be under six words if or divided into two parts. The author should give his highest degree, his insti position or his relationship to a hospital or medical organization which he addressing. Pages should be numbered consecutively and the author's last name appear at the top of each page after the first page.

Biographical references should appear on a separate sheet entitled "Bibliography." Th should appear and be numbered consecutively in the order in which they first o the text (not alphabetically). Citations in the text require reference numbers author's or authors' names are not used or if there is more than one reference same author or group of authors. All references to author should appear Bibliography and no references should be included which are not in the text. T and exact punctuation used in the J.A.M.A. references is requested. For a journal *Author's last name, initial, initial.: title of paper. Abbreviated name of journal, number: page, year.* Book references should give author, title, edition numbe publisher and year.

Illustrations (photographs, tables and graphs) should be submitted separately combined in the text. There should be a separate sheet entitled "Illustrations" contains the various types of illustrations listed separately and numbered in th

Medicine

ly, 1956

Volume 39
Number 7

MISCELLANEOUS ARTICLES

ORIALS

hosomatic Research 481
icians-Hospitals-Public 481
T vision and the Youngsters 482
R abilitation in Pulmonary Tuberculosis 482
Symptoms of Alcoholism 483
History of Glass Containers 484
P nocardiography: A Lost Opportunity 484
keeping 485

ICAL ECONOMICS

R alts of Physicians' Social Security Poll Announced 487
H se of Delegates Passes Series of Recommendations 487
ate Committee Acts on H.R. 7225 488
tary Dependent Medical Care Bill 488
.O Assembly Reinstates Russia; Reduces Her Bill 488
Doctors Really Overpaid? 488
nesotan Receives Appointment 488
IA Acts as International Voice 488
F eign Medical School Graduates to be Evaluated 489
A Closes Printing Plant 489
ninistration Sponsors Legislation 489
to Investigate Value of "Tranquilizing" Drugs 489
sicians to be Drafted for Navy Duty 489
tors Top Earners Among Professions in Canada 489

SIDENT'S LETTER

Golden Age of Medicine 490

HISTORY OF MEDICINE IN MINNESOTA

The Medical History of Rice County (1855-1901)
(Continued from April issue)
Adolph M. Hanson, M.D., Faribault, Minnesota 492

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

Physicians Licensed, 1955 497
Physician's License Revoked 503
Minneapolis Quack Sentenced for Illegal Healing 503
Granite Falls "Reflexologist" Sentenced 503

MEETINGS AND ANNOUNCEMENTS 504

IN MEMORIAM 505

WOMAN'S AUXILIARY 506

GENERAL INTEREST 507

BOOKS RECEIVED FOR REVIEW A-33

CLASSIFIED ADVERTISING A-36

INDEX TO ADVERTISERS A-38

innesota Society of Clinical Pathologists
innesota Society of Internal Medicine
innesota Society of Neurology and Psychiatry
Minnesota State Medical Association
Minnesota Surgical Society
Northern Minnesota Medical Association
Southern Minnesota Medical Association

ORMATION

ich they appear in the text. All photographs must be in black and white, clear contrasting, and on glossy prints. Instructions for combining photographs are table. Any number of illustrations over 4 are charged to the author. Combinations otographs up to one-half page (6 x 4⅜ inches) count as 1 illustration.

ers and Reviewers

e right is reserved to reject material submitted for reading or advertising columns. views expressed in this journal do not necessarily represent those of the Minnesota Medical Association or any of its constituents.

rtisers and Subscribers

ssified advertising—10 cents a word; minimum charge $2.00; key number, 25c ional. Remittance should accompany order. Display advertising rates on request.

nual Subscription—$3.00. Single Copies—$0.40. Foreign and Canadian—$3.50.

mmunications concerning advertising and subscriptions should be addressed to NESOTA MEDICINE, 2642 University Avenue, Saint Paul 14, Minnesota. Telephone Mid-5-2641.

yright and Post Office Entry

ntents of MINNESOTA MEDICINE ©1956 by Minnesota State Medical Association.

tered at the Post Office in Saint Paul as second class matter. Accepted for mailing at special rate of postage provided for in Section 1103, Act of October 3, 1917, orized July 13, 1918.

Board of Editors

ARTHUR H. WELLS, M.D.
Editor-in-Chief, Duluth

STUART W. ARHELGER, M.D.
Minneapolis

JOHN F. BRIGGS, M.D.
Saint Paul

S. FRANCIS CEPLECHA, M.D.
Redwood Falls

TAGUE C. CHISHOLM, M.D.
Minneapolis

ROBERT B. HOWARD, M.D.
Minneapolis

R. DREW MILLER, M.D.
Rochester

HENRY G. MOEHRING, M.D
Duluth

GLENN J. MOURITSEN, M.D.
Fergus Falls

OLIVE V. SEIBERT, B.A.
Saint Paul

GEORGE STILWELL, M.D.
Rochester

For

HAY FEVER,

COLDS,

SINUSITIS

NTZ®

Nasal Spray

CONVENIENT NONBREAKABLE SQUEEZE BOTTLE

A physiologically balanced formulation of three well known and widely used compounds:

N eo-Synephrine® HCl, 0.5%
dependable decongestant

T henfadil® HCl, 0.1%
powerful antihistaminic

Z ephiran® Cl, 1:5000
wetting agent and antibacterial

DELIVERS FINE EVEN SPRAY
LEAKPROOF

Rapidly Effective

No Antibiotic Sensitization

Supplied in
spray bottle
containing 20 cc.

Winthrop LABORATORIES • NEW YORK 18, N. Y.

NTZ, Neo-Synephrine (brand of phenylephrine), Thenfadil (brand of thenyldiamine) and Zephiran (brand of benzalkonium, as chloride, refined), trademarks reg. U.S. Pat. Off.

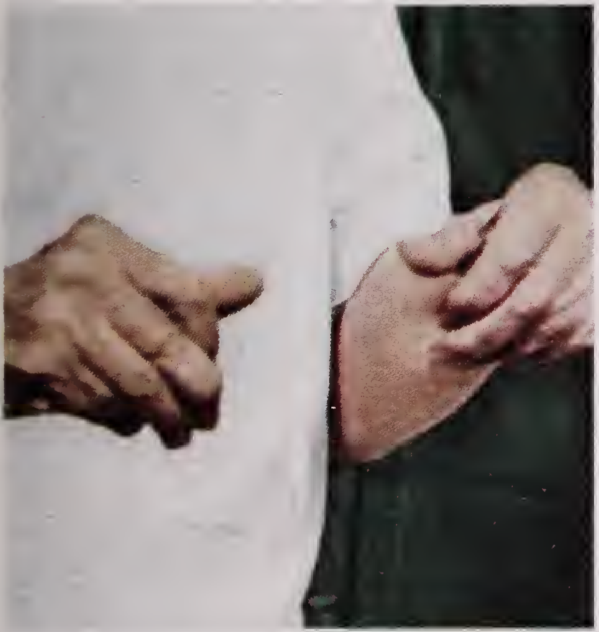
in rheumatoid arthritis

METICORTEN

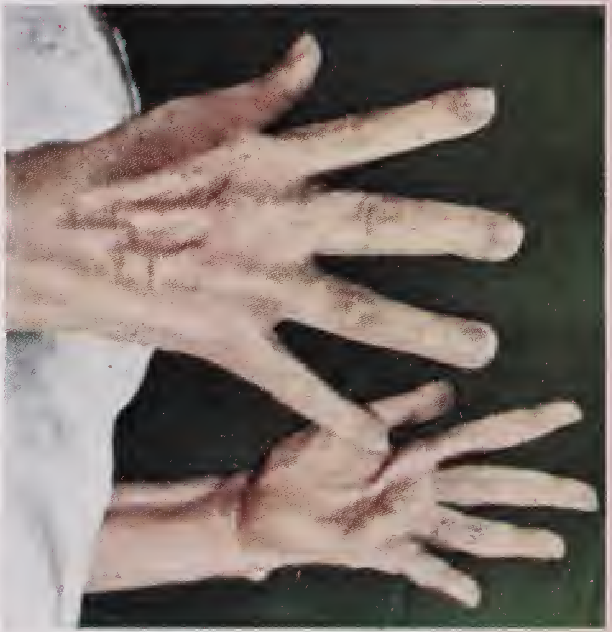
(PREDNISONE)

Schering

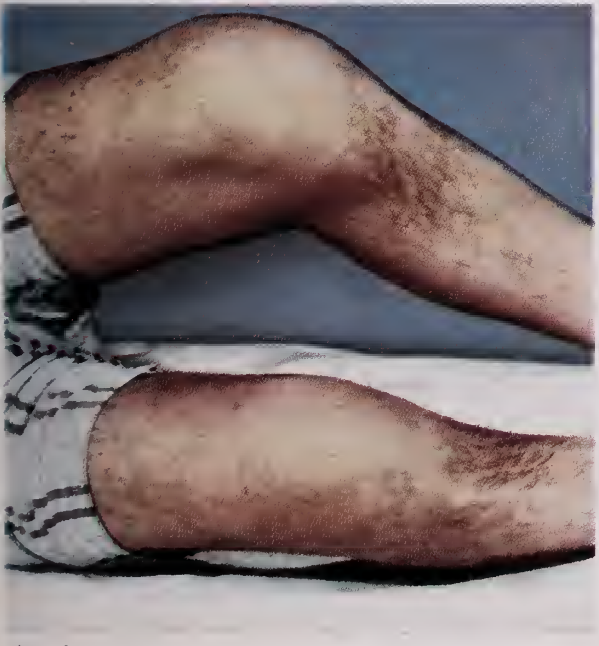
results—*excellent* • edema—*rare*



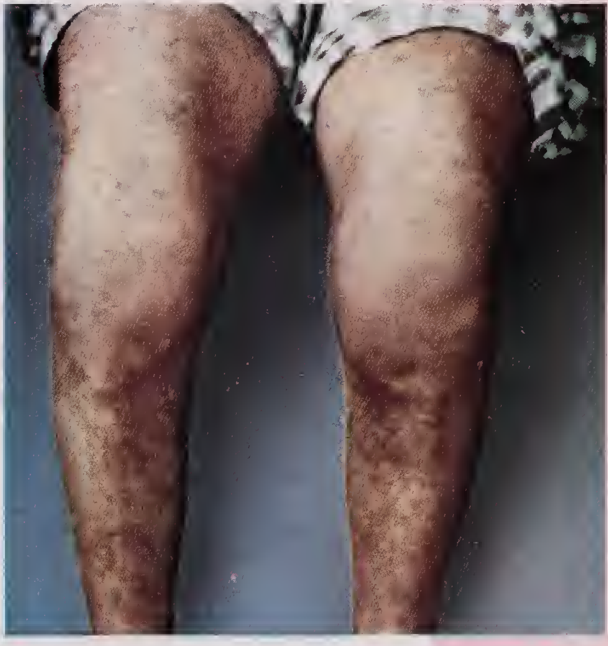
Deformed hands of woman with rheumatoid arthritis before therapy. Unable to open hands.



After two weeks on METICORTEN, *patient is free of pain and can open hands completely.*



Acutely swollen, painful knees in man with rheumatoid arthritis before therapy.



After two weeks on METICORTEN, *swelling of knees is gone and patient can walk without difficulty.*

Schering
METICORTEN
PREDNISONE
SCHERING

in corticosteroid therapy permits treatment of more patients

- rarely causes edema or electrolyte side actions
- 3 to 5 times more potent, milligram for milligram, than hydrocortisone or cortisone
- excellent relief of pain, swelling, tenderness; diminished joint stiffness—in rheumatoid arthritis
- excellent relief of bronchospasm, dyspnea, cough; increased vital capacity in asthma
- hormone benefits in respiratory allergies, inflammatory and allergic eye and skin disorders, collagen diseases

METICORTEN is available in 1 mg., 2.5 mg. and 5 mg. white tablets, and as 2.5 mg. and 5 mg. capsules.
METICORTEN,* brand of prednisone. MC-J-614-356 *T.M.

a pause for reflection . . . Operation finished. You sit back and relax. Blockain* anesthesia lasted long enough with one small injection so that you were easily able to proceed from incision to closure without pause for reinjection. **Longer anesthetic duration . . .** You did that accurate reapproximation of skin edges without distortion from freshly introduced anesthetic. And more, Blockain persisted post op.—you had no complaints of uncomfortable splints, dressings or tender tissues. **Rapid onset, too . . .** You recall that the pre-incision wait was avoided. *A case to remember:* A 78-year-old patient, arteriosclerotic, poor liver function with a transcervical fracture of left femur, underwent a *one-hour-and-20-minute operation,* involving internal fixation of the fracture and the placement of a Smith-Petersen nail, with *one injection of Blockain.* Effect of anesthetic: "excellent." Onset of anesthesia: "rapid." Only 60 cc. of Blockain was used. A whiff of nitrous oxide was given at the time of actual hammering, to spare the patient emotional trauma. There were no side effects. **BLOCKAIN,** 30 cc., 0.5% (5 mg./cc.). Write GEORGE A. **Breon** & CO., 1450 Broadway, N. Y. 18 for additional information.

2-PROPOXY DERIVATIVE OF 2-DIETHYLAMINOETHYL 4-AMINOBENZOATE.

*BLOCKAIN® BRAND OF PROPOXYCAINE HYDROCHLORIDE BREON.

highly successful

- faster relief of pain, photophobia
- better control of inflammation, edema, allergy
- effective against common eye pathogens
- extremely well tolerated

now availabl

for inflammatory, allergic, infectious or traumati eye conditions amenable to topical therapy—rapi potent, topical Meti-steroid and anti-infective actio

supplied: METIMYD Ophthalmic Suspension-*Sterile*: prednisolone acet (METICORTELONE Acetate) 5 mg. per cc. (0.5%) suspended in an isoto buffered and preserved solution of sulfacetamide sodium 100 mg. per (10%), 5 cc. dropper bottle. METIMYD Ointment with Neomycin: each gr contains 5 mg. prednisolone acetate (METICORTELONE Acetate), 100 sulfacetamide sodium and 2.5 mg. neomycin sulfate (equivalent to 1.75 neomycin base); ⅛ oz. tube, boxes of 1 and 12.

METIMYD,* brand of prednisolone acetate and sulfacetamide sodium.
METICORTELONE,® brand of prednisolone.
*T.M.

. in topical eye therapy

new

METIMYD*

(prednisolone acetate and sulfacetamide sodium)

Ophthalmic Suspension-Sterile

and

METIMYD

(prednisolone acetate and sulfacetamide sodium with neomycin sulfate)

Ointment with Neomycin

antibacterial • antiallergic • anti-inflammatory

Schering

What can Municipal Bonds Do for YOU?

THEY CAN:

PROVIDE FUNDS FOR YOUR CHILDREN'S EDUCATION

"School days—school days—dear old Golden Rule Days"
Never has a college education been so necessary or has it cost so much.
When will your children (or grand children) be ready for college? Five, ten or fifteen years? Municipal Bonds can be purchased today to come due in any year—yes, even to the exact month.

PAY READY CASH FOR THAT RAINY DAY

"April showers May Come Your Way"—We hope not, but if adversity strikes, ready saleable Municipal Bonds can provide needed funds for accidents, illnesses, and any other emergencies.

BUILD UP A TIDY SUM FOR THAT LONG VACATION

"All work and no play makes Jack a dull boy"
Enjoy the fruits of your labor! Long vacations require advance financial planning. Let municipal bonds help you provide the ready cash for your recreation and relaxation.

MAKE YOUR RETIREMENT DREAMS COME TRUE

"From a little acorn the mighty oak tree grows"
Will you be retiring or just plain tiring? Consistent saving with municipal bonds is a sure-fire way to obtain financial independence when you retire. Municipal Bonds *earn more* because they are *tax-free.*

ACCUMULATE A READY RESERVE FOR THE EXPANSION OF YOUR BUSINESS

"Opportunity comes to he who is prepared"
Prepare for future opportunities in your business by investing reserve funds in Municipal Bonds—safe, saleable and tax-free!

ENABLE YOU TO BUY THAT HOME IN YOUR FUTURE

"Be it ever so humble—there's no place like home"
You, too, can have that new home. What could be more desirable than a nest egg of tax-free Municipal Bonds to make your plans come true?

Reprinted from "Municipal Bonds and You" our colorful sixteen-page book that is available to you Free!

Yes, Municipal Bonds can be used for many planned purposes. An investment in municipal bonds is an investment for your better future.

Name______________________________

Address____________________________

City____________________ State________

MM-7-6

JURAN & MOODY, INC.

Municipal Bonds Exclusively

Rand Tower
MINNEAPOLIS 2

93 East 6th St.
ST. PAUL 1

Citizens and Southern Buildin
ATLANTA, GA.

TELEPHONE: CApital 4-9661

NOW AVAILABLE....

a new unique antibiotic

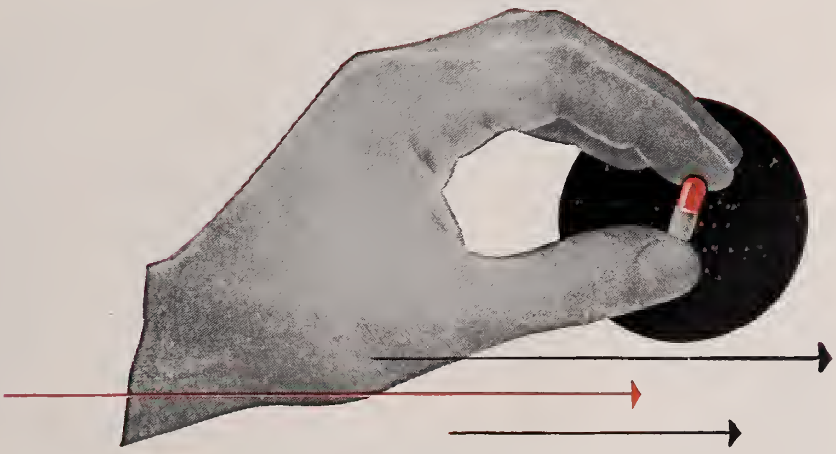
PROVED EFFECTIVE

AGAINST SPECIFIC

ORGANISMS ***(staphylococci and proteus)***

RESISTANT TO ALL OTHER

ANTIMICROBIAL AGENTS



to overcome specific infections that do not respond to any other antibiotics.[1,2,3]...

New...

TODAY's resistant pathogens are the tough survivors of a dozen widely used antibiotics. Certain organisms, notably *Staphylococcus aureus*[4] and susceptible strains of *Proteus vulgaris* produce infections which have been resistant to *all* clinically useful antibiotics.

To augment your armamentarium against these resistant infections, 'CATHOMYCIN' (Novobiocin, Merck), derived from an organism recently discovered and isolated in the Merck Sharp & Dohme Research Laboratories[1], is now available.

SPECTRUM—'CATHOMYCIN'[1,2,3,5,6] has also been shown to be active against other organisms including—*D. pneumoniae*, *N. intracellularis*, *S. pyogenes*, *S. viridans and H. pertussis*, but clinical evidence must be further evaluated before 'CATHOMYCIN' can be recommended for these pathogens.

ACTION—'CATHOMYCIN' in optimum concentration is bactericidal. Cross-resistance with other antibiotics has not been observed.[7]

TOLERANCE—'CATHOMYCIN' is generally well tolerated by patients.[5,6,8,9,10,11]

'CATHOMYCIN'

(Crystalline Sodium Novobiocin, Merck)

SODIUM

ABSORPTION—'CATHOMYCIN' is readily absorbed[5,6,9] and oral dosage produces significant blood and tissue levels which persist for at least 12 hours.[7]

INDICATIONS: Clinically 'CATHOMYCIN' has proved effective for cellulitis, carbuncles, skin abscesses, wounds, felons, paronychiae, varicose ulcer, pyogenic dermatoses, septicemia, bacteremia, pneumonia and enteritis due to *Staphylococcus* and infections caused by susceptible strains of *Proteus vulgaris*.[6,7,8,9,10,11,12,13,14] Also, it is of particular value as an adjunct in surgery since staphylococcic infections seem prone to complicate post-operative courses.

SUPPLIED: 'CATHOMYCIN' Sodium (Crystalline Sodium Novobiocin, Merck) in capsules of 250 mg., bottles of 16.

'CATHOMYCIN' *is a trademark of Merck & Co., Inc.*

REFERENCES:

1. Wallick, H., Harris, D.A., Reagan, M.A., Ruger, M., and Woodruff, H.B., *Antibiotics Annual*, 1955-1956, New York, Medical Encyclopedia, Inc., 1956, pg. 909.
2. Frost, B.M., Valiant, M.E., McClelland, L., Solotorovsky, M., and Cuckler, A.C., *Antibiotics Annual*, 1955-1956, pg. 918.
3. Verwey, W.F., Miller, A.K., and West, M.K., *Antibiotics Annual*, 1955-1956, pg. 924.
4. Kempe, C.H., *Calif. Med.*, **84**:242, April 1956.
5. Simon, H.J., McCune, R.M., Dineen, P.A.P., Rogers, D.E., *Antib. Med.*, **2**:205, April 1956.
6. Lubash, G., Van Der Meulen, J., Berntsen, C., Jr., Tompsett, R., *Antib. Med.*, **2**:233, April 1956.
7. Lin, K.-E., Coriell, L.L., *Antib. Med.*, **2**:268, April 1956.
8. Limson, B.M., Romansky, N.J., *Antib. Med.*, **2**:277, April 1956.
9. Morton, R.F., Prigot, A., Maynard, A. de L., *Antib. Med.*, **2**:282, April 1956.
10. Nichols, R.L., Finland, M., *Antib. Med.*, **2**:241, April 1956.
11. Mullins, J.F., Wilson, C.J., *Antib. Med.*, **2**:201, April 1956.
12. David, N.A., Burgner, P.R., *Antib. Med.*, **2**:219, April 1956.
13. Marton, W.J., Heilman, F.R., Nichols, D.R., Wellman, W.E., and Geraci, J.F., *Antib. Med.*, **2**:258, April 1956.
14. Milberg, M.B., Schwartz, R.D., Silverstein, J.N., *Antib. Med.*, **2**:286, April 1956.

SHARP & DOHME

Philadelphia 1, Pa.
DIVISION OF MERCK & CO., INC.

Get the Facts!!

about the

PROFESSIONAL CREDIT PROTECTIVE BUREAU

The Professional Credit Protective Bureau has proved very beneficial to many professional people who have adopted this excellent credit control and collection service.

We urge you to make use of this service since it will be of great benefit in recovering long delinquent accounts and in eliminating, through proper control measures, the accumulation of slow and bad accounts.

Professional Credit Protective Bureau
701 Metropolitan Bldg., Minneapolis 1, Minn.

YES, I would like to give the PROFESSIONAL CREDIT PROTECTIVE BUREAU a trial. Please ask one of their representatives to call on me without obligation to explain the plan in detail.

NAME ....

ADDRESS ....

new Peach-flavored,
peach-colored, newest
liquid form of the
established broad-spectrum antibiotic...
TERRAMYCIN®†
125 mg. per 5 cc.
teaspoonful;
specially homogenized
for rapid absorption;
bottles of 2 fl. oz.
and 1 pint, packaged
ready to use.

delightful peach taste in broad-spectrum therapy

TERRABON®

BRAND OF OXYTETRACYCLINE

HOMOGENIZED MIXTURE

PFIZER LABORATORIES, *Division, Chas. Pfizer & Co., Inc.*, Brooklyn 6, N. Y. *Pfizer*

†Brand of oxytetracycline

CHILDREN'S SIZE
BAYER
ASPIRIN
48 TABLETS
25¢
FLAVORED
Children's Size
BAYER
®
ASPIRIN
BAYER
REG. U.S. PAT. OFF.
Genuine
48 TABLETS
25¢
1¼ GRS. EA.
THE BEST TASTING ASPIRIN
YOU CAN GIVE YOUR CHILD
℞

How to win *little* friends . . .

The Best Tasting Aspirin you can prescribe.
The Flavor Remains Stable down to the last tablet.
25¢ Bottle of 48 tablets (1¼ grs. each).

We will be pleased to send samples on request.

THE BAYER COMPANY DIVISION
of Sterling Drug Inc.
1450 Broadway, New York 18, N. Y.

because a diuretic
should be able to control
any degree of failure

PATIENTS IN FAILURE NEED AN ORGANOMERCURIAL

Certain diuretics are apt to mask the gradual onset of severe failure because they are effective only in the milder ambulatory cardiacs. The recurrent accumulation of fluid permitted by intermittent or arbitrarily limited dosage must eventually progress to more severe decompensation.

Because they can control *any* grade of failure, the organomercurials improve prognosis and prolong life.

TABLET
NEOHYDRIN®
BRAND OF CHLORMERODRIN (18.3 MG. OF 3-CHLOROMERCURI-2-METHOXY-PROPYLUREA EQUIVALENT TO 10 MG. OF NON-IONIC MERCURY IN EACH TABLET)

a standard for initial control of severe failure

MERCUHYDRIN® SODIUM
BRAND OF MERALLURIDE INJECTION

LAKESIDE

01356

WHY
SENSITIZE

in topical and ophthalmic infections

USE
'POLYSPORIN'®
brand

POLYMYXIN B—BACITRACIN OINTMENT

to insure broad-spectrum therapy
with minimum allergenicity

For topical use: in ½ oz. and 1 oz. tubes.
For ophthalmic use: in ⅛ oz. tubes.

BURROUGHS WELLCOME & CO. (U.S.A.) INC., Tuckahoe, N. Y.

looked over often...

the patient with nonspecific rheumatism

NOW—thoroughgoing relief with

NEW SIGMAGEN TABLETS

combining

Prednisone	0.75 mg.	—best of the new
Acetylsalicylic acid . . .	325 mg.	—best of the old
Ascorbic acid	20 mg.	
Aluminum hydroxide . .	75 mg.	

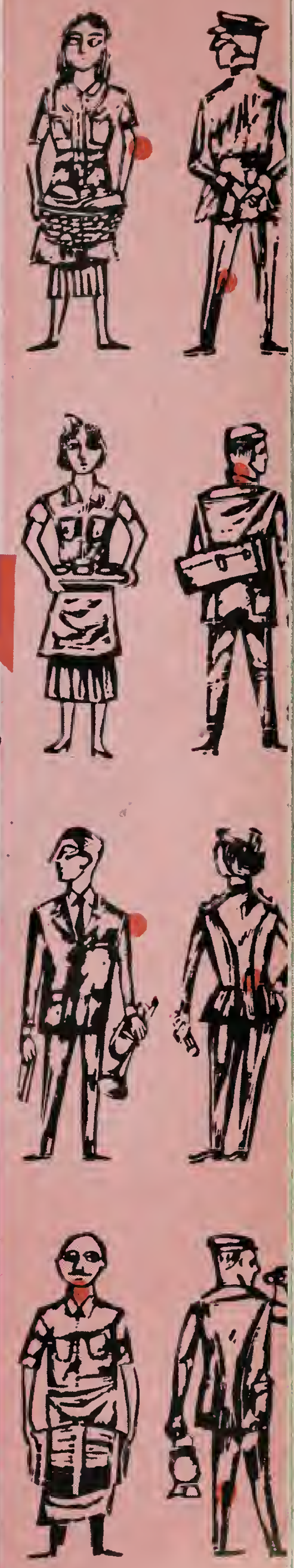
antirheumatic • anti-inflammatory • analgesic • supportive

Combined effectiveness of the antirheumatic agents in SIGMAGEN permits maintenance of clinical relief at minimal dosages.

SIGMAGEN,* brand of corticoid-analgesic compound.
*T.M.

Schering

SG-J-51



for the acutely agitated...

QUIESCENCE AND EMOTIONAL DETACHMENT

NEW Potent Ataraxic

Sparine*

HYDROCHLORIDE

Promazine Hydrochloride

10-(γ-dimethylamino-*n*-propyl)-phenothiazine hydrochloride

INDICATIONS:

- The acute alcoholic[1,2]—delirium tremens, acute hallucinosis, tremulousness
- The acute psychotic[1]—acute excitation due to various psychoses
- The drug addict[1]—withdrawal syndrome: nausea, vomiting, muscle and bone pains, abdominal cramps, general malaise

FINDINGS:

"The drug . . . is effective in . . . maintaining these subjects in a quiescent detached state. . . . Complications such as jaundice, . . . dermatitis, edema, lactation, basal ganglion disturbances, or depression were not observed during these studies."[1]

As with any new and potent agent, it is well to be fully informed on the precautions of use and the possibility of side-effects. Before prescribing SPARINE, the physician should consult the direction circular.

For intravenous, intramuscular, or oral administration.

Supplied: Tablets, 25, 50, and 100 mg., bottles of 50 and 500; 200 mg., bottles of 500. Injection, 50 mg. per cc., vials of 2 and 10 cc.

1. Fazekas, J.F., et al.: J.A.M.A. **161**:46 (May 5) 1956. 2. Mitchell, E.H.: J.A.M.A. **161**:44 (May 5) 1956.

*Trademark

An Exclusive Development of Wyeth Pharmacological Research

Wyeth ®
Philadelphia 1, Pa.

DOCTORS EVERYWHERE NOW KNOW WHY

Viceroys Are Smoother

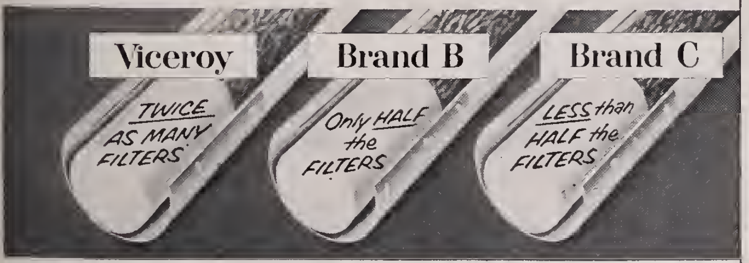
THE VICEROY TIP HAS . . .
TWICE AS MANY FILTERS

Professional men who have studied the microscopic analysis of the Viceroy filter now know why the Viceroy taste is smoother—never rough. Only Viceroy has 20,000 tiny filters in every tip—twice as many filters as the other two largest-selling filter brands. That is why Viceroys are smoother by far—never, never rough. That is why so many doctors now smoke and recommend Viceroys.

Yes, smoother taste because there are

TWICE AS MANY FILTERS IN EVERY VICEROY TIP

as the other two largest-selling filter brands!


Viceroy
TWICE AS MANY FILTERS
Brand B
Only HALF the FILTERS
Brand C
LESS than HALF the FILTERS

Viceroy's exclusive filter is made from pure cellulose—soft, snow-white, natural!

VICEROY
TWENTY
VICEROY
Filter Tip
CIGARETTES
KING-SIZE

recognized

as a potent, specific anti-arthritic

established

by over 100 million patient days

substantiated

in more than 700 published reports

BUTAZOLIDIN®

(phenylbutazone GEIGY)

potent, specific anti-arthritic

Based on an impressive background of achievement attained over a period of four years involving both long-term and short-term therapy in all the major forms of arthritis, BUTAZOLIDIN is recognized as one of the most effective anti-arthritic agents currently available.

relieves pain

improves function

resolves inflammation

BUTAZOLIDIN being a potent therapeutic agent, physicians unfamiliar with its use are urged to send for literature before prescribing it.

GEIGY

GEIGY PHARMACEUTICALS, Division of Geigy Chemical Corporation, New York 13, N. Y.

72556

When you want a wide-spectrum antibacterial ...

Gantrisin is effective against a wide variety of pathogenic organisms causing common infections.

... with a minimum of side effects

Gantrisin is exceptionally well tolerated by patients of all ages, is relatively non-sensitizing, does not cause overgrowth of fungi... and is not likely to produce crystalluria and renal blocking because of its high solubility in body fluids over a wide pH range.

Gantrisin® - brand of sulfisoxazole

Hoffmann - La Roche Inc • Nutley • N.J.

Check list — for infections in children

Which advantage of Gantrisin (acetyl) Pediatric Suspension is most important to you?

... a wide antibacterial spectrum

... no overgrowth of fungi

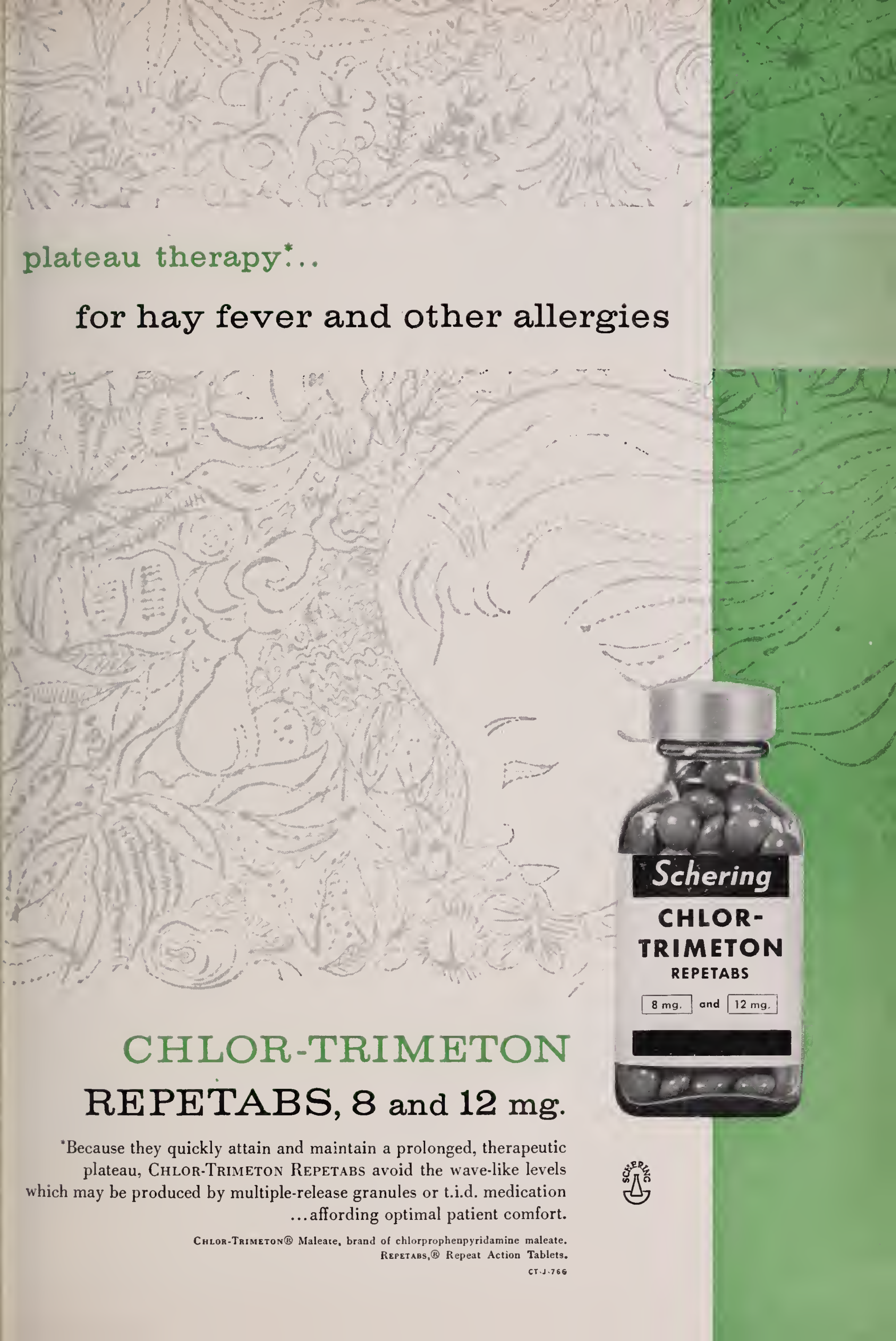
... minimized danger of sensitization or emergence of resistant strains

... pleasant flavor without medicine taste

... no alkalies required

All these advantages together
have made Gantrisin® Pediatric Suspension

"a sulfonamide of first choice for children."



plateau therapy*...

for hay fever and other allergies

CHLOR-TRIMETON
REPETABS, 8 and 12 mg.

*Because they quickly attain and maintain a prolonged, therapeutic plateau, CHLOR-TRIMETON REPETABS avoid the wave-like levels which may be produced by multiple-release granules or t.i.d. medication ...affording optimal patient comfort.

CHLOR-TRIMETON® Maleate, brand of chlorprophenpyridamine maleate.
REPETABS,® Repeat Action Tablets.
CT-J-766

The Birches Sanitarium, Inc.

2391 Woodland Avenue
Duluth 3, Minnesota

A hospital for the care and treatment of Nervous and Mental disorders. Quiet, cheerful environment. Specially trained personnel. Recreational and occupational therapy.

Dr. L. R. Gowan, M.D., M.S., Medical Director

Now your patients can select the **FRAME** *of their choice in the* **COLOR** *of their choice with* **BENSON'S**

COLOR-FUSE

COLOR-FUSE is an exclusive BENSON process for adding almost any color to virtually every frame.

Your patients can choose from 32 basic colors ... add any shading desired ... select any frame style with plain or engraved temples ... choose just the right trim ... and add jewelled screws for that ultra-feminine touch!

This process now makes it possible for you to offer your patients the choice of thousands of exciting eyewear combinations — made to order for them.

School colors, milady's favorite color or the current fashion color are now possible with COLOR-FUSE — and COLOR-FUSE is guaranteed against fading, chipping or peeling.

Send today for prices and a sample selection of **COLOR-FUSE** *frames*

Benson Optical Co. • Minneapolis 2, Minn.
Gentlemen: I'd like to know more about your COLOR-FUSE service. Send me prices and sample frames. Dept. MM76

Name____________________

Address____________________

City__________Zone____State______

Since 1913

Benson
OPTICAL COMPANY

Executive Offices
Minneapolis 2, Minn.

COMPLETE LABORATORIES CONVENIENTLY LOCATED IN UPPER MIDWEST CITIES

the point is this...

HydroCortone® -T.B.A.

(HYDROCORTISONE *TERTIARY*-BUTYLACETATE, MERCK)

produces superior results — greater symptomatic relief and longer-lasting remissions — in both rheumatoid arthritis and osteoarthritis.

SHARP & DOHME

SUPPLIED: SALINE SUSPENSION HYDROCORTONE-T.B.A.—25 MG./CC., VIALS OF 5 CC.

References: 1. Hollander, J. L., *Ann. New York Acad. Sc.* **61**:511, May 27, 1955.
2. Hollander, J. L., *et al. J.A.M.A.* **158**:476, June 11, 1955.

Philadelphia 1, Pa.
DIVISION OF MERCK & CO., INC.

for a spastic GUT

Trasentine®-Phenobarbital

integrated relief . . .
mild sedation
visceral spasmolysis
mucosal analgesia

TABLETS *(yellow, coated), each containing 50 mg. Trasentine® hydrochloride (adiphenine hydrochloride CIBA) and 20 mg. phenobarbital.*

CIBA
Summit, N. J.

2/2228M

New STEELINE Pediatric Table

Eases the burden of the physician's daily work

Includes built-in tare balance scale, built-in measuring rod, foam rubber cushion and electrical outlets with cord and plug—there are no accessories to buy. Top quality construction features include all-welded steel body, two roomy drawers and a large open compartment with shelf, providing easy, unhampered access to instruments and supplies. Front edge is protected from wear by a stainless steel baffle plate. Despite the fact that this new table has been designed to provide the physician with the best modern equipment, efficient modern production methods in our own factory permit us to keep the price well below that of comparable models. Write today for complete information.

a. s. aloe company OF MINNESOTA
927 Portland Avenue, Minneapolis 4, Minn. • Phone:

BETTER

results are obtained with STERANE[1] — 3 to 5 times more active than hydrocortisone or cortisone.

BREATHING

capacity is greatly enhanced. "Relief of symptoms is more complete and maintained for longer periods with relatively small doses."[2]

BALANCE

of minerals and fluids usually remains undisturbed. This proves "especially advantageous in those patients with cardiac failure requiring therapy . . ."[3]

in bronchial asthma

Sterane®

brand of prednisolone

Supplied: White, 5 mg. oral tablets, bottles of 20 and 100. Pink, 1 mg. oral tablets, bottles of 100. Both deep-scored.

1. Johnston, T. G., and Cazort, A. G.: J. Allergy 27:90, 1956. 2. Schwartz, E.: New York J. Med. 56:570, 1956. 3. Schiller, I. W., et al.: J. Allergy 27:96, 1956.

PFIZER LABORATORIES
Division, Chas. Pfizer & Co., Inc.
Brooklyn 6, New York

A MODERN
PRIVATE
SANITARIUM

for the
Diagnosis, Care
and Treatment
of Nervous
and Mental
Disorders

MAIN BUILDING—One of 10 Units in "Cottage Plan"

ST. CROIXDALE ON LAKE ST. CROIX

PRESCOTT, WISCONSIN

Located on beautiful Lake St. Croix, 18 miles from the Twin Cities, it has the advantages of both City and Country. Every facility for treatment provided, including recreational activities and occupational-therapy under trained personnel. Close personal supervision given patients, and modern methods of therapy employed. Inspection and cooperation by reputable physicians invited. Rates very reasonable. Illustrated folder on request.

Prescott Office
Prescott, Wisconsin
Howard J. Laney, M.D.
Tel. 39 and Res., 76

Consulting Neuro-Psychiatrists
Hewitt B. Hannah, M.D., Andrew J. Leemhuis, M.D.
527 Medical Arts Bldg., Tel. FE. 2-1357, Minneapolis, Minn.

Superintendent
Ella M. Leseman
Prescott, Wisconsin
Tel. 69

for your complete insurance needs . . .

- ☆ PROFESSIONAL
- ☆ PERSONAL
- ☆ PROPERTY

CHOICE OF THE MINNESOTA MEDICAL
ASSOCIATION FOR PROFESSIONAL
LIABILITY INSURANCE

ST. PAUL FIRE AND MARINE CO. • ST. PAUL MERCURY INDEMNITY CO. • MERCURY INSURANCE CO.

The Saint Paul Companies
SINCE 1853
INSURANCE
LAND • SEA • AIR

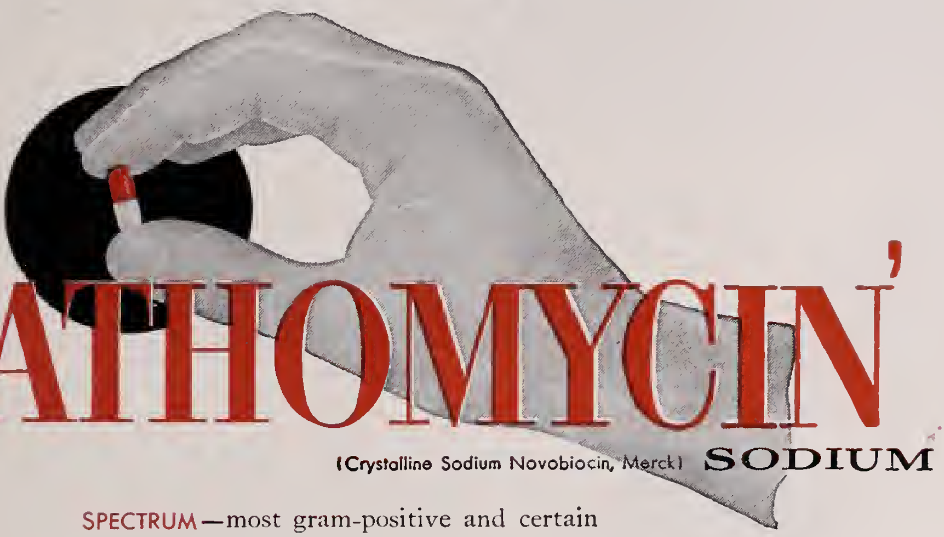
THERE IS A SAINT PAUL AGENT IN YOUR COMMUNITY
AS CLOSE AS YOUR PHONE

HOME OFFICE: 111 WEST FIFTH STREET, SAINT PAUL 2, MINNESOTA

NOW AVAILABLE...

a unique new antibiotic
of major importance

PROVED EFFECTIVE AGAINST
SPECIFIC ORGANISMS
(staphylococci and proteus)
RESISTANT TO ALL OTHER
ANTIMICROBIAL AGENTS



'CATHOMYCIN' SODIUM

(Crystalline Sodium Novobiocin, Merck)

SPECTRUM—most gram-positive and certain gram-negative pathogens.

ACTION—bactericidal in optimum concentration even to resistant strains.

TOXICITY—generally well tolerated. This is more fully discussed in the package insert.

ABSORPTION—oral administration produces high and easily-maintained blood levels.

INDICATIONS—cellulitis, pyogenic dermatoses, septicemia, bacteremia, pneumonia and enteritis due to *Staphylococcus* and infections involving certain strains of *Proteus vulgaris;* including strains resistant to all other antibiotics.

DOSAGE—four capsules (one gram) initially and then two capsules (500 mg.) twice daily.

SUPPLIED—250 mg. capsules of 'CATHOMYCIN', bottles of 16.

'CATHOMYCIN' *is a trademark of Merck & Co., Inc.*

SHARP
DOHME

Philadelphia 1, Pa.
DIVISION OF MERCK & CO., INC.

WE CORDIALLY INVITE YOUR INQUIRY for application for membership which affords protection against loss of income from accident and sickness as well as benefits for hospital expenses for you and all your eligible dependents.

APH
OMAHA
APC
OMAHA
the Emblems of RELIABLE PROTECTION

SINCE
1902

ALL
PREMIUMS
COME FROM

PHYSICIANS
SURGEONS
DENTISTS

ALL
BENEFITS
GO TO

$4,500,000 ASSETS
$23,800,000 PAID FOR BENEFITS
SINCE ORGANIZATION

**PHYSICIANS CASUALTY
AND
HEALTH ASSOCIATIONS**
OMAHA 2, NEBRASKA

organomercurial diuretics "...permit ingestion of enough salt to make food palatable; without them, many patients would lose their appetites, a consequence of the salt-free diet which has occasionally been known to cause serious malnutrition."*

*Modell, W.: The Relief of Symptoms, Philadelphia, W. B. Saunders Company, 1955, pp. 265-266.

03156

Cook County Graduate School of Medicine

INTENSIVE POSTGRADUATE COURSES
STARTING DATES—SUMMER & FALL, 1956

SURGERY—Surgical Technic, two weeks, August 6, September 17
Surgical Anatomy and Clinical Surgery, two weeks, October 1
Surgery of Colon and Rectum, one week, September 17
General Surgery, one week, October 22
Thoracic Surgery, one week, October 1
Esophageal Surgery, one week, September 24
Breast and Thyroid Surgery, one week, October 22
Gallbladder Surgery, three days, October 29
Fractures and Traumatic Surgery, two weeks, October 15

GYNECOLOGY & OBSTETRICS — Obstetrics and Gynecology, three weeks, October 22
Office and Operative Gynecology, two weeks, September 17
Vaginal Approach to Pelvic Surgery, one week, September 10

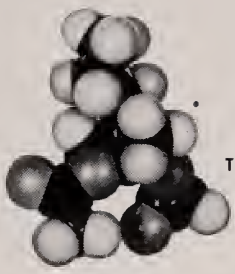
MEDICINE—Electrocardiography and Heart Disease, two week basic course, October 8; one week advanced course, September 17
Internal Medicine, two weeks, September 24
Gastroscopy and Gastroenterology, two weeks, September 10
Gastroenterology, two weeks, October 22
Dermatology, two weeks, October 15
Cardiology (Pediatrics), two weeks, November 5

RADIOLOGY—Diagnostic X-Ray, two weeks, September 17
Clinical Uses of Radioisotopes, two weeks, October 8

UROLOGY—Two-week course, October 8
Cystoscopy, ten days, by appointment

TEACHING FACULTY—ATTENDING STAFF OF COOK COUNTY HOSPITAL

ADDRESS: REGISTRAR, 707 South Wood Street,
Chicago 12, Illinois



THE MILTOWN MOLECULE

A tranquilizer well suited for prolonged therapy

NO ORGANIC CONTRAINDICATIONS

reported to date

- well tolerated, non-addictive, essentially non-toxic
- no blood dyscrasias, liver toxicity, Parkinson-like syndrome or nasal stuffiness
- chemically unrelated to chlorpromazine or reserpine
- does not produce significant depression
- orally effective within 30 minutes for a period of 6 hours

Indications: anxiety and tension states, muscle spasm.

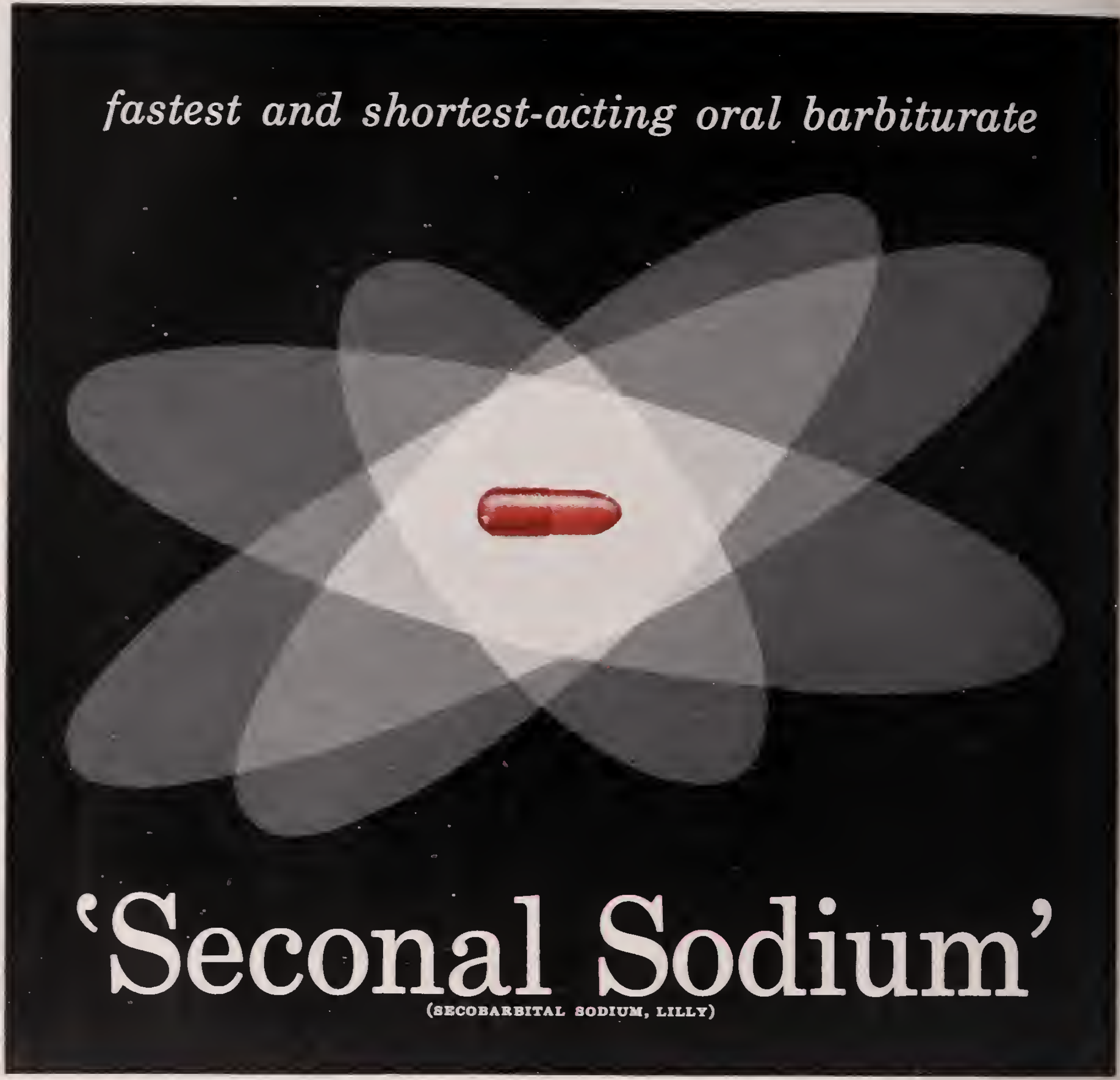
Miltown®

the original meprobamate—2-methyl-2-n-propyl-1,3-propanediol dicarbamate—U.S. Patent 2,724,720

SUPPLIED: 400 mg. scored tablets. Usual dose: 1 or 2 tablets t.i.d.

DISCOVERED AND INTRODUCED by Wallace Laboratories, New Brunswick, N. J.

Literature and Samples Available on Request



fastest and shortest-acting oral barbiturate
'Seconal Sodium'
(SECOBARBITAL SODIUM, LILLY)

622011

Lilly
QUALITY / RESEARCH / INTEGRITY

The secret of sleep in a capsule

When simple insomnia is the presenting complaint, a bedtime dose of 'Seconal Sodium' is often indicated. Its effect is prompt—within fifteen to thirty minutes; relaxation and sleep follow quickly. Your patient awakens refreshed and well rested.

Available in 1/2, 3/4, and 1 1/2-grain pulvules at pharmacies everywhere.

80TH ANNIVERSARY 1876 • 1956 / ELI LILLY AND COMPANY

Original Contributions

New Techniques in Cholecystography

L. HENRY GARLAND, M.B., B.Ch.
San Francisco, California

THIS is the thirtieth anniversary of the death of the distinguished clinician in whose honor this lecture is named. It happens also to be the thirtieth anniversary of my own induction into training in the specialty to which he, Russell Carman, added such lustre. Need I say how deeply honored I feel to have been invited here by the Minnesota Radiological Society (which sponsors this lecture at the annual meeting of your state association), especially since the city in which it is being delivered is that wherein Dr. Carman's own life work reached fruition?

To speak on any radiological subject in Rochester is akin to bringing carboniferous material to Newcastle. And yet, having accepted your invitation, I must try. To speak on the subject suggested by your Committee on Scientific Assembly, namely, cholecystography or cholangiography, is tantamount to effrontery, since Carman's successor, Dr. B. R. Kirklin, is a world authority thereon. But your committee has a persuasive chairman, and I shall therefore assay a brief discussion of certain aspects of the field of cholic radiology.

* * *

When I commenced my residency at Stanford in 1926 (under Dr. W. E. Chamberlain), nonopaque disorders of the gall bladder were diagnosed partly by evidence of displacement or indentation of adjacent viscera (by an enlarged vesicle), and partly by signs of "reflex irritation." The diagnostic reliability of these indirect signs was known to be of low order. Then, like a beam of sunlight into a darkened cave, came the availability of a discovery made two years previously by colleagues of Carman working in the city which he had left about 1914 to join the Clinic.

It had been known for several years that certain dyes were excreted almost entirely by the liver in the bile. Amongst these was tetrachlorphenolphthalein, which was used as a liver function test. In 1924, Graham, Cole and Copher of St. Louis[3] substituted bromine for the chlorine in this molecule and showed that after intravenous injection enough of the opaque material entered the gall bladder to produce a roentgen shadow. The reactions following intravenous bromph-phthalein were rather severe and iodine was substituted. Later it was discovered that after ingestion of tetraiodophenolphthalein the dye was absorbed from the intestinal tract, excreted in the bile and a gall-bladder shadow produced. Dr. Warren Cole, now at Chicago, kindly gave me copies of slides showing the first cholecystogram obtained in a dog, and the first in a human subject. He also furnished this historic photograph of the three research workers made outside the Mallinkrodt Institute some ten years after their discovery. (Slides shown.)

The water absorptive power of the gall-bladder mucosa plays an important part in the production of the orally obtained gall-bladder shadow. Unconcentrated bile directly from the liver does not usually contain enough of an orally administered medium to cast a good shadow. In the gall bladder, water is absorbed from the bile and the amount of solids (and therefore of opaque elements) is increased approximately fivefold. The result is a relatively dense shadow produced by the contents but commonly referred to as the gall bladder.

Since 1930 numerous and improved media have been developed in various parts of the world, all of them tending to reduce the incidence of undesirable reactions and improve the opacity of the roentgen shadow. Indeed, the quality of some of these media is such that shadows of too dense nature may easily be produced and result in the masking of calculi and papillomata.

There is a vast amount of literature on the need for certain types of diet before and after

---

The Carman Memorial Lecture, delivered at the annual meeting of the Minnesota State Medical Association, Rochester, Minnesota, May 21, 1956.

cholecystography; indeed, several pages are devoted to the topic of different menus in one excellent loose-leaf diagnostic roentgenology. It is now apparent that many of these dietetic rituals are not essential. However, as in the examination of any abdominal structure, reasonable colonic cleansing and reasonable absence of confusing objects such as buttons and folds of clothing are aids to improved roentgenograms.

Preliminary Examination

Because many of you are general practitioners, I would like briefly to re-emphasize and illustrate the great value of the properly made "plain film of the abdomen" in patients suspect of gall-bladder disease. The following is a summary of the more important conditions it may disclose—many of which will obviate the need for subsequent biliary opacification.

1. Opaque biliary calculi. To detect some of these, we should recollect the wide variation in location of the gall bladder, in both horizontal and erect positions. *Biliary opacities,* including limey bile, may be masked by spine or pelvic bone shadows. The value of a cleared colon, arrested motion and *adequately large* survey roentgenograms is considerable.

When differentiation between biliary and other calculi is difficult, or when identification of probable localization is desired, anterior stereoscopic, lateral or oblique projections are of considerable value. The former have fallen into undeserved disuse.

2. Non-opaque calculi. Cholesterin stones occasionally contain stellate gas shadows to reveal their presence in plain films.

3. Biliary wall disease. The gall-bladder wall may be visible because of *calcification* or *gas.* Calcareous cholecystitis is not common. Emphysematous cholecystitis is even more rare, but readily diagnosable. The gas may be luminal and ductal, as well as mural.

4. Biliary tract air or opaque media. The contrast medium may be vesicular or ductal (and intra- or extra-hepatic): the culprit calculus or ulceration is often difficult to locate. Most cases of spontaneous *internal biliary fistula* are due to gallstone erosion into the gastrointestinal tract.

5. Pancreatic calculi and calcifications. These may project in the gall-bladder area on oblique roentgenograms; their differentiation is based on size, shape and location; *supine and lateral* film should supplement the prone views.

6. Miscellaneous opacities. These include medicinal substances or contrast media in the colon (we have seen pills and barium residues in diverticula misinterpreted as gallstones on occasion); calcified mesenteric nodes; renal calculi and calcifications; arterial calcifications; *adrenal* calcifications; dental and osseous material in *dermoids*; extrinsic and cutaneous opacities. Hydrops may sometimes be demonstrable.

By careful examination and consultation mos of the above opacities or lucencies can be correctly localized and identified. When no pertinent abnormality is detected on the plain films, contras study may be indicated.

Cholecystography

The simplest, safest and most effective genera method of cholecystography is by the oral administration of contrast media[2,4,8,9]. Satisfactory media currently available are iopanoic acid (Telepaque) and iodophenoxic acid (Teridax)[1]. Our standard procedure for the average adult is as follows:

1. The patient is requested to have his regular evening meal at about 6:00 p.m. At 7:00 p.m. he takes 2 gm. (four tablets) of Telepaque, and refrains from food and liquids thereafter.

2. At 9:00 a.m. a survey film is made: if a satisfactory shadow of the gall-bladder contents is obtained, two or more additional films are made at different phases of respiration or in different positions (erect and right lateral decubitus), in order to detect any abnormal shadows that may be present. In selected cases, multiple erect "spot films" are made with the fluoroscope, using graded compression, especially for the study of mural radiolucencies. The patient is then given breakfast or its equivalent (a good emptying lipid preparation being Neocholex), and, depending on the problem at hand, films made ten to thirty minutes later. The earlier films show the ducts; the later films, the partly contracted gall bladder. The ducts can be seen in about 75 per cent of standard examinations.

3. If the initial films show a faint or absent gall-bladder shadow, the patient is instructed to repeat the medication again at 7:00 p.m. If he is large (over 165 pounds) the dose is doubled. He is examined next morning. If a satisfactory shadow is obtained, the examination is continued as indicated above. If no shadow is obtained, the examination is terminated and reported as "non-functioning gall bladder on two successive oral examinations."

The above routine presupposes several things: 1) that the patient is able to co-operate, take ie medicine at the correct time, and subsequently ist; (2) that he has no pyloric obstruction or iarked intestinal hypermotility; either may pre-ent adequate absorption of iodine; (3) that his olon is reasonably clean; if not, he is given a eansing enema by the x-ray technician at the me the initial cholecystogram is made. We have ied and abandoned other methods (such as arenteral pitressin) for gas dispersion. For pa-ents who will not co-operate, or have pyloric bstruction, the intravenous method is used.

In private practice, dealing with ambulatory atients and with skilled x-ray technicians, the ercentage of satisfactory examinations is very igh, exceeding 99 per cent. In county hospital r clinic practice, expecially with bed-confined atients, or with less interested technical help, ie percentage is lower. Side-reactions, in either roup, are negligible. Seedorf and others have eported transitory, silent, pseudoalbuminuria in bout 15 per cent of patients. A variable number omplain of mild dysuria (not related to the albumin" excretion).

The value of immediate repeat examination is vident from the following data, based on the ist several hundred cases seen in our office:

The standard (2 gm.) single dose examination ; diagnostic in about 90 per cent of cases: the all bladder shows fair to normal function, and tones (if present) are demonstrated.

Repeat oral examination (using single or double ose, depending on the patient's size) is diagnostic n the remaining 10 per cent of cases. The listribution of these repeat studies showed the ollowing approximate figures:

Normal function, without stones, 2 per cent.
Normal function, with stones, 2 per cent.
Poor function, with stones, 3 per cent.
No function or miscellaneous lesions, 3 per cent.

TABLE I. DIFFERENTIAL DIAGNOSIS OF "TUMORS" IN FUNCTIONING GALL BLADDER

In erect spot films of gall bladder, without or with compression.

	Papilloma	*Cholesterol polyp*
Size (diam.)	5-10 mm.	1-5 mm.
Shape	Irregular	Round or oval
Number	Single (50%)	Single (66%)
Significance	Potentially neoplastic	Metabolic disorder?
Approx. Incidence in G. B. Studies	0.5%	0.5%

After Hammer, R. W.*

It is our opinion (based on the cases we have xamined) that intravenous examination subse-uent to a non-functioning initial oral study has eldom been more informative than a repeat oral xamination as far as cholecystic disease is con-erned. However, if one is dealing with patients nsuitable for, or unco-operative with, oral study, he intravenous route may be indicated. It some-imes reveals common-duct stones not shown on the oral films (Fig. 1). It may be helpful in jaundiced patients.

The reliability of properly performed cholecystography for the detection of cholesterin calculi in a functioning gall bladder is almost 100 per cent. For the detection of cholecystitis it has a closely related figure, so long as the technique is correct and some moderate degree of liver function is present. A "nonfunctioning gall bladder," confirmed by an immediate repeat or second examination is indicative of biliary tract disease. Kirklin and O'Donnell[4] reported that in patients having surgery after cholecystography, 98 per cent of positive diagnoses were confirmed. Wickbom and Rentzhog[12] found a similar figure. Moes[6] recently reported the accuracy of cholecystography in 200 surgically verified cases as about 98 per cent.

At the same time, it must be remembered that failure to demonstrate stones does not always mean that small cholesterin calculi can be excluded. Conversely, a normally concentrating gall bladder may sometimes be partly diseased. It is estimated that if one third of the normal gall-bladder mucosa is present, fairly good concentration can sometimes be achieved. Many authors have commented on the excellence of some gall-bladder shadows despite microscopic evidence interpreted as chronic cholecystitis.

The most common sources of error in cholecystography are poor preparation of the patient, and incorrect roentgen examination (both technical and interpretative).

Space does not permit the illustration of the many anomalous and pathologic conditions of the biliary tract demonstrable with cholecystography. However, mention should be made of the increasing demonstrability of lesions formerly difficult to show. One of these is diverticulosis of the gall bladder, also known as Luschka's crypts, and Rokitansky-Aschoff sinuses. The latter are not uncommon in gross specimens of chronic cholecystitis but were seldom demonstrated radiologically.[7]

Intravenous Cholecystography

Since the introduction of sodium iodipamide (Cholografin or biligrafin) in 1952, there has been a recrudescence of interest in intravenous cholecystography. Indeed, some workers have proposed the "rapid" intravenous method as being preferable to the oral one.[1]

The indications for intravenous cholecystography may be summarized as follows:

1. Persons with serious intestinal tract disturbances such as pyloric obstruction, intractable vomiting, etc.
2. Unreliable or unco-operative persons, including perhaps infants.
3. Occasional patients with acute abdominal conditions in which emergency examination of the biliary tract is indicated.
4. Patients with persistent biliary symptoms following operation (including those in whom the nature of the operation was uncertain, those with postcholecystectomy syndrome, and others).
5. Exceptional cases in which the gall bladder has failed to show function after two properly performed consecutive oral examinations. (In most such cases, the correct diagnosis is gall-bladder disease, and the intravenous method is not necessary.)

The reasons that more general use of the intravenous method is not regarded as advisable include the following: the hazards are greater than with the oral method; there are about 5 per cent of disturbing side reactions with intravenous cholecystography as compared to almost none with oral cholecystography.[8,11,13] The time required in the x-ray department is considerably longer, and the cost of materials is greater. The gall-bladder shadows are confused by associated pyelographic shadows in about 15 per cent of cases. (This does not necessarily indicate liver damage.) Finally, and most important, the films may be misleading if the gall-bladder bile is not well mixed. Prone films made early in the examination may disclose a relatively dense peripheral shadow in the gall-bladder area, presumably due to more concentrated opaque bile close to the water-absorbing mucosa; the central radiolucent area may resemble a large cholesterin stone. Film made with a horizontal beam may disclose strat fication or layering of the gall-bladder shado resembling or concealing floating stones. The layers apparently represent bile of different sp cific gravities, the lowest being concentrate opaque bile, the intermediate zone, some of th nonopaque bile originally in the gall bladde and the upper zone unconcentrated opacified bi entering from the ducts.

Aldridge[1] uses the following method for intr venous cholecystography: The patient is prepare by having him take a meal or suitable fat preparation about two hours prior to reportin for examination; this helps to obtain an emp gall bladder. When preliminary films disclose th necessity therefor, a cleansing enema is given. I the average adult, 50 mg. of demerol is the injected intravenously, in order to increase th tonus of the choledochal sphincter and aid reten tion in the ducts and gall bladder. After flushin the needle thoroughly (to prevent precipitatio of the opaque medium), 10 cc. of 40 per cen Cholografin is injected very slowly; a larger dos is used for obese patients. Films are made abou forty-five minutes after injection; if satisfactor gall-bladder shadows are obtained, the patient then given the usual emptying meal and con traction films made after about twenty minute Aldridge reports that he was successful in demon strating a gall-bladder shadow in a high percen tage of 100 patients, including three of eleve jaundiced cases. This latter finding may, o course, mean that opaque ductal bile merel backed up into the gall bladder, not that the gall bladder mucosa was capable of concentrating it.

Undesirable reactions to intravenous Chologra fin include nausea, vomiting, occasional sensatio of burning in the throat or flushing of the fac and nose, itching, sneezing and transitory cutane ous wheals. There is no satisfactory preliminar test by which such reactions may be predicted. W have seen one case of cutaneous necrosis followin a preliminary skin test. Probably the best metho of diminishing or reducing reactions is slow injec tion and suitable preliminary medication in th case of persons with a history of allergy.

Non-operative Cholangiography

Since the subject of cholangiography is of con siderable interest at the present time, a few wor on this topic may not be out of place. In patien th functioning gall bladders, *"oral"* cholangio-ams may be secured in as high as 90 per cent cases by correct timing of the after-breakfast ll-bladder films. When films are made approximately ten minutes after an emptying or fatty meal, the cystic and common ducts are usually visible. In some patients, the main hepatic ducts are also visible.

The important place of cholangiography is of course in persons with a "post-cholecystectomy" syndrome in whom there is a question of residual stones or an obstructive lesion.[5] We have secured satisfactory cholangiograms in a fair percentage of cases by the oral method and in a somewhat higher percentage of cases by the intravenous method.

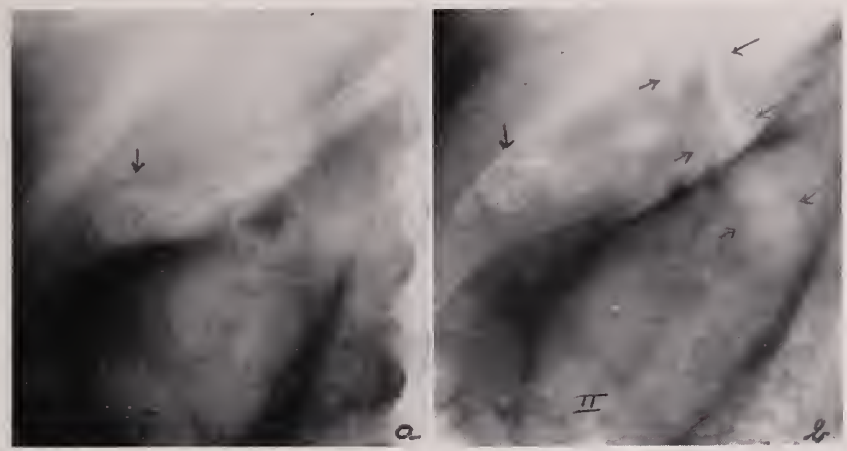


Fig. 1. Preoperative demonstration of common duct stones. Example of occasional value of intravenous opaque medium supplemental to oral examina-duct). (b) Repeat oral examination next day confirms a non-functioning gall cholecystogram (there are multiple calcified stones in the gall-bladder; there is no visible gall-bladder function; there is a faintly visible dilated common duct). (b) Repeat oral examination next day confirms a non-functioning gall bladder and a dilated common duct (17 mm.). However, the contrast in the latter is not sufficiently good to rule out stones.

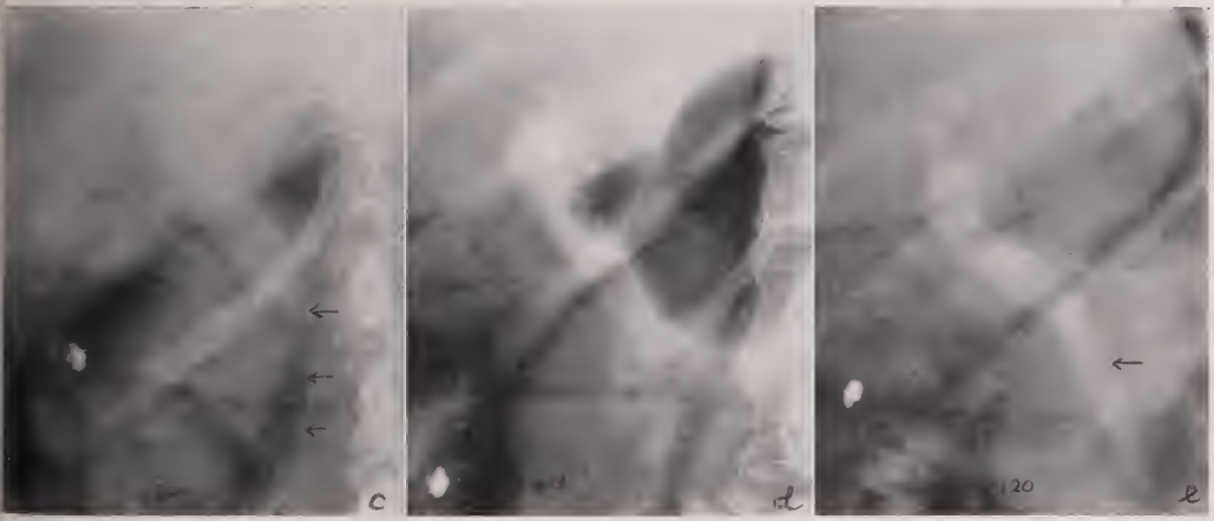


Fig. 1. (c) Examination after intravenous cholografin. There is excellent visibility of the hepatic ducts and the dilated common duct; multiple cholesterin stones ranging from 5 to 15 mm. in diameter are seen in the distal half of the common duct. The timing of these films (c, d, and e) was thirty, forty and 120 minutes after injection.

TABLE II. DIAMETER OF COMMON DUCT SHADOW (IN ROENTGENOGRAMS OF ADULTS)

	Mean	Range
1. "Normal" subjects (no operation)	5 mm.	(3-10)
2. Post-cholecystectomy (no symptoms)	8 mm.	(3-15)
3. Post-cholecystectomy "syndrome"	11 mm.	(5-25)

The following is our technique for the oral method. The patient is given a double dose of Telepaque at 9:00 p.m. (4 grams for the average adult). At 11:00 p.m. he is asked to take 2 drams of paregoric and to refrain from other liquids or food. The initial films are made approximately ten hours later. In thin patients and with correct radiographic technique, the common duct can be shown in about 50 per cent of cases, especially those with obstructive disorders.

The intravenous technique is similar to that previously outlined for intravenous cholecystography. Depending on the problem at hand, the patient may or may not be given a small dose of demerol or morphine prior to the examination. He is then given 20 cc. of 40 per cent Cholografin intravenously, the injection being made very slowly during a period of about eight minutes. Roentgenograms of the biliary area are made at about ten, twenty and thirty minutes. When the duct visualizes slowly, or the presence of stones or stricture is uncertain, additional roentgenograms are made at sixty and 120 minutes. In cases where stones are clearly visible in the initial roentgenogram, and in which this is the only diagnostic problem, the examination may be terminated therewith.

In a series of some 300 patients with symptoms referable to the biliary tract (one-third of whom had not been operated upon), Wise and O'Brien[13] obtained ductal shadows by intravenous cholangiography in about 85 per cent. They believe that non-visualization is apt to occur only "if the serum bilirubin value is above 4.8 mg. or the sulfobromophthalein retention is above 40 per cent."

Berk et al in a smaller series found the ducts to be demonstrable with oral examination (Telepaque) in 55 per cent of patients, and with intravenous medium (Cholografin) in about 90 per cent.

The diameter of the common duct as it appears on the roentgenograms is influenced by many factors, including the thickness of the patient, the target-film distance, the tonus of the duct and choledochal sphincter, and the intraductal biliary pressure. The roentgen image is one usually magnified about 30 per cent. The common duct is often wider after cholecystectomy. Further, the mean diameter tends to be somewhat higher in patients with the so-called postcholecystectomy syndrome than in those without symptoms of recurrent biliary tract disease. In Table II are representative figures for adults (based on our own experience, plus that of Berk et al, Shehadi, and Wise et al).

It has been suggested by Wise and O'Brien that ducts less than 8 mm. in diameter are probably not obstructed, while those more than 15 mm. probably are partly or completely blocked. They utilize the *persistence of a dense ductal shadow* for two or more hours as suggesting obstruction in ducts measuring between 8 and 15 mm. In our experience, early appearance of the duct shadow and its gradual fading away during a two-hour period suggests normalcy; late appearance and persistence of the shadow suggests obstruction. Further, fading out of the terminal portion of the common duct shadow tends to be normal, while a blunt or cigar-shaped terminal duct tends to indicate obstruction. These observations require avoidance of sphincter tonic medication such as demerol, morphine, et cetera.

The apparent length of the common duct should be noted: if the duct appears to be shorter than usual, stricture or extrinsic pressure should be suspected.

In addition to the problems previously mentioned (layering of bile and superimposed pyclogram shadows) an occasional source of confusion in the interpretation of cholangiograms is the presence of opaque medium in the duodenal bulb or gastric antrum; the opacified bile trickles into the duodenum in the recumbent position and, by gravity or reverse peristalsis, enters the duodenal bulb or gastric antrum, with subsequent production of a pseudo-gall-bladder or pseudo-diverticulum shadow. It should be repeated that with either oral or intravenous cholangiography, the failure to demonstrate ductal calculi does not exclude their presence. Examination of the films should be performed with good illumination, multiple views and, when possible, joint consultation between the referring physician and the radiologist. Indeed, "two pairs of expert eyes" are often revelatory in the interpretation of the faint or delicate shadows sometimes existing in nonoperative cholangiograms.

Summary

holecystography, thanks in part to continuous mical research and in part to improved roent- ologic technique, is undergoing steady improve- nt.

he importance of proper preparation of the ient, correct dosage of opaque medium, regular uences of roentgenographic exposures, and good ntgenologic technique is again stressed. To se, I would add critical examination of the ntgenograms under optimum conditions of ns-illumination, and joint consultation.

he shadows of the biliary ducts are visible a high percentage of post-cibum oral cholecy- grams; attention to such shadows will permit *preoperative* diagnosis of ductal stones and ormities more frequently than hitherto. When doubt, immediate intravenous iodixamide may used to supplement the oral study.

ntravenous cholecystography is indicated in a y small percentage of patients, notably those h obstructive upper gastrointestinal lesions, derate degrees of jaundice, or situational in- lity to co-operate with simpler and safer oral minations.

The great usefulness of nonsurgical cholangio- phy is stressed, especially in patients presenting gnostic problems relative to the common bile ct.

Roentgen conclusions concerning apparent disease involving the terminal portions of this duct ("stenosing papillitis," "sphincteric fibrosis," et cetera) should be tempered by complete information as to the patient's concurrent medication. Drugs augmenting choledochal sphincter tone may produce transitory defects.

References

1. Aldridge, N. H.: Rapid examination of the biliary tract. J. Fac. Rad., 6:243, 1955.
2. Berk, J. E.; Stauffer, H. M.; Shay, H., and Karnofsky, R.: The normal and abnormal intravenous cholecystangiogram. Gastroenterol., 28:230, 1955.
3. Graham, E. A., and Cole, W. H.: Roentgenologic examination of the gall-bladder. J.A.M.A., 82:613, 1924.
4. Kirklin, B. R., and O'Donnell, D. B.: Present-day cholecystography. J.A.M.A., 151:261, 1953.
5. McClenahan, J. L.; Evans, J. A., and Braunstein, P. W.: Intravenous cholangiography in the post-cholecystectomy syndrome. J.A.M.A., 159:1353, 1955.
6. Moes, C. A. F.: Investigation of the accuracy of cholecystography. J. Canad. A. Rad., 6:33, 1955.
7. Moore, R. D.: Diverticula of the gall-bladder. Am. J. Roent., 75:360, 1956.
8. Reynolds, L., and Fulton, H.: Oral cholecystography with telepaque. J.A.M.A., 159:1358, 1955.
9. Seedorf, E. E., and Powell, W. M.: Experience with five orally given cholecystographic mediums. J.A.M.A., 159:1361, 1955.
10. Shehadi, W. H.: Intravenous cholecystocholangiography. J.A.M.A., 159:1350, 1955.
11. Theander, G.: Side effects of biligrafin. Acta Rad., 43:369, 1955.
12. Wickbom, I. G., and Rentzhog, V.: The reliability of cholecystography. Acta Rad., 44:185, 1955.
13. Wise, R. E., and O'Brien, R. G.: Interpretation of the intravenous cholangiogram. J.A.M.A., 160:819, 1956.

X-RAY AS AN AID TO PINPOINTING NEUROMUSCULAR DISEASE EARLY

The importance of the roentgen examination s given the pediatrician and radiologist the op- rtunity of being among the first to suspect the gnosis in neuromuscular disease of the urinary ct in children, according to R. Parker Allen, D., whose report was published in the Sep- ber, 1955 issue of *Radiology*.

'Neuromuscular disease of the urinary tract ults from the variety of congenital and ac- ired conditions. It is usually complicated by ection and obstruction. Because of the lack of arly defined diagnostic criteria, it is often glected in differential considerations," Dr. Al- explained.

Some other conclusions advanced by Dr. Al- :

. . . Many of the disorders of the urinary ct in children have some neurogenic basis. Those with definite associated clinical disease present practically no diagnostic problem except for determination of how much of the difficulty is due to the neurological disorder and how much to subsequent infection and obstruction.

. . . Cases associated with megacolon are more easily detected because of the known association of the two conditions and the similarity of pattern in cases already reported.

. . . The remaining group of neurogenic dysfunctions, unassociated with other disease, must be differentiated from the much more numerous mechanical obstructions and associated chronic infections. Cystograms, pyelograms, cystometrograms, and in more difficult cases medical and surgical therapeutic trials, are the basis of differentiation.

Posttraumatic Intraocular Hemorrhage

F. G. FOLKEN, M
Albert Lea, Minnes

IT IS encouraging to realize that at last we are becoming properly conscious of posttraumatic intraocular hemorrhage, a condition that is capable of robbing a patient of useful vision in the affected eye. Perhaps our awareness has been sharpened by war experiences, which demonstrated that intraocular hemorrhage is a common finding in concussion injuries from blast; or perhaps it is just that more of us have had to see a young girl or boy lose the sight in an eye because a form of treatment that would unfailingly prevent this catastrophe has not yet been devised. Admittedly, few individuals suffer a loss of vision by this route, but the low incidence neither lessens the tragedy nor relieves us of our obligation to find a mode of treatment sufficiently effective to promise at least reasonably good final visual acuity for all these patients.

In civilian life children and teenagers are most often the victims of direct trauma to the eye—from stones, BB shots, tennis balls and the like—and, as might be expected, the injury is usually sustained during recreational or sports activities. Among adults, the injury is also likely to occur in recreational as well as occupational pursuits.

Intraocular hemorrhage may be classified as:

- I. Anterior chamber hemorrhage.
  - 1. Single.
  - 2. Secondary or recurrent (and according to Chandler:)
    - (a) Iris invisible, blood clot black with surface homogeneous.
    - (b) Iris partially visible, blood red with structure of hemorrhage distinguishable.
- II Vitreous hemorrhage
  - 1. Single
  - 2. Secondary

We are concerned here primarily with anterior chamber hemorrhage and the emphasis will be on secondary and recurrent anterior chamber hemorrhage since it is principally in patients experiencing two or more hemorrhages that we must fear the development of complications that c lead to a partial or complete loss of sight.

At this point let us review the pathological a atomy in intraocular hemorrhage. According O'Neill it may be: (1) a tear at the root of t iris, (2) a rent in the ciliary body, (3) the fo ing of blood back through the canal of Schlem

Cordes and Horner correlate certain features the lesion with the pathological anatomy and sa

1. Rapid bleeding into the anterior chamber follow a rupture of Schlemm's canal, the rupture be caused by a small rounded object striking the corn scleral margin.

2. Rapidly *absorbing* anterior chamber hemorrh usually follows injuries limited to the iris—(such iridodialysis, rupture of the sphincter, iridemia and ra or circular tears).

3. Hemorrhages *filling* the chamber are produced layer tears.

4. In injuries of less severity than usual, the bl comes from ruptured vessels and diffuses over the

5. Occasionally, intraocular hemorrhage results fr damage to a retinal vessel.

6. *Vitreous* hemorrhages follow rupture of blood sels of the ciliary body or choroid.

Kilgore's experimental work on monkeys vealed that contusion frequently caused cili body damage, particularly anteriorly, and that these instances separation of the ciliary body fr the sclera always occurred—damage ranging fr a slight tear of its substance to complete dislo tion. His work also suggested that the bleed noted two or three days after iridodialysis pr ably is a result of seepage from this impai tissue.

In concussion injuries from blast, intraoc hemorrhage from rupture of the iris and cili body is common.

Not infrequently an eye injured by direct tr ma shows only intraocular hemorrhage—in form of free blood that usually fills about third of the anterior chamber. Fortunately most cases this initial hemorrhage absorbs reasonable speed, vision soon becomes normal the patient goes his way little the worse for

---

Read at the annual meeting of the Southern Minnesota Medical Association, Albert Lea, September 12, 1955.

eperience. However, certain of these patients—jt when they are recovering satisfactorily, are fe of pain and have regained fair vision—sudcnly develop a secondary hemorrhage, most comronly into the anterior chamber, though occasionay into the vitreous. This secondary hemorrhage ry occur any time from the *first* to the *seventh* cv after injury but the most likely days are the sond, third and fourth.

More often than not this secondary hemorrhage i accompanied by a rise in the intraocular presse. Of course the early posttraumatic stage may t characterized by an instability of tension but ts situation is of little consequence since stabilition usually takes place within a fairly short ne. According to Duke-Elder, ". . . the variatns in (intraocular) pressure after a contusion e caused by local neurovascular reactions. . . ." owever, he goes on to say, ". . . traumatic glauma is based on these reactions. Simple hyperny or hypotony is the physiologic response to uma—glaucoma is the pathologic effect". We e at a distinct disadvantage in the matter of this condary tension rise because we cannot predict nen or in whom it will come, nor can we deterine what initiates the rise.

There is disagreement as to whether a clot forations portends a disastrous end result, although ere seems little doubt that the eye with free ood in the anterior chamber—rather than a clot responds more favorably to treatment and less ten demands operative intervention.

The question of paracentesis is perhaps less vigously argued, the consensus being that simple racentesis is indicated in the presence of ineased intraocular tension and frequently inditedted in the presence of secondary hemorrhage, rticularly if blood fills the entire chamber.

Summing up what our collective experience has ught us to expect in regard to final vision we nd that:

1. The occurrence of a secondary hemorrhage always anges the prognosis from good to bad.
2. With an elevation in intraocular pressure, a bad ognosis immediately becomes worse.
3. When secondary hemorrhage develops within fortyght hours of the time of injury, the ultimate outcome usually poor.
4. A hemorrhage that takes the form of a tough, bbery clot often means a rise in tension and addional bleeding.
5. A delay in performing paracentesis—when the dications for it are clear—may spell disaster.

The complications of posttraumatic intraocular hemorrhage, out of which can come the loss of useful vision if not actually the loss of an eye, are: (1) bloodstaining of the cornea, not due to infiltrating blood cells but to absorption of blood pigment, (2) iris atrophy, (3) secondary glaucoma, (4) glaucomatous optic atrophy with anterior staphyloma—occasionally requiring enucleation.

It is Duke-Elder's view that bloodstaining of the cornea—in which, incidentally, there is no bleeding into the cornea but rather a staining caused by absorption of blood pigment through Descemet's membrane from the anterior chamber—is the only *permanent* result that may follow hyphemia. According to Rychener, bloodstaining—macroscopically—ranges in color from a rusty-red-brown, to a greenish-black or yellow, to a white. Ordinarily the staining is disciform with a clear portion of cornea around the limbus so that at certain stages of resolution the appearance may be that of a lens dislocated into the anterior chamber.

Staining clears gradually from the periphery inward, usually leaving a central patch of gray that may clear even after two or more years—*unless* secondary glaucoma is persistent, in which case the cornea becomes white and unsightly. It is the experience of some observers that useful vision is not recovered following bloodstaining and secondary glaucoma *even though the cornea may clear*. Rychener feels that there is an uncomfortably narrow margin between secondary hyphemia and bloodstaining of the cornea and points out that in one patient of his, faint central bloodstaining of the cornea was observed, during paracentesis, only five hours after the appearance of a secondary hemorrhage. Evidence indicates that increased intraocular pressure is the determining factor in the production of bloodstaining of the cornea.

The iris atrophy resulting from hyphemia and increased intraocular tension is an essential type that can, and often does, continue to total aniridia.

It is estimated that secondary glaucoma supervenes in somewhat more than 50 per cent of those cases with secondary hemorrhage and increased intraocular tension. All too often final vision is only light perception, and enucleation is not the rarity it should be. Rones, reporting on non-perforating ocular injuries in soldiers—almost all of whom showed intraocular hemorrhage and all of whom did require enucleation—lists the following pathologic changes noted in eyes enucleated from one day to two weeks after injury: (1) beginning organization of intraocular hemorrhage, (2) blood-staining of the cornea, (3) inflammation, (4) secondary glaucoma.

In eyes removed from two weeks to three months after injury, the incidence of inflammation and secondary glaucoma was increased and in this group beginning atrophic changes were found. This report serves to point up the relative speed with which these changes take place, thereby emphasizing the importance of devising and adopting a type of initial treatment that will prevent the complications under discussion.

The debate over the use of mydriatics or miotics appears to have been touched off in 1931 when Hardesty, Green and Luedde reported that secondary glaucoma followed almost on the heels of the administration of atropine to a patient with a secondary intraocular hemorrhage. Since that time atropine has slowly lost its popularity, and there is now a widely held conviction that the use of atropine immediately after injury may well be responsible for a subsequent rise in intraocular tension and recurrent hemorrhage.

Rychener, in 1944, urged the use of miotics in place of atropine on the ground that while atropine does dilate the iris and so compresses the iris stroma and the blood vessels it contains, secondary hemorrhages are often caused by injured iris vessels. Physostigmine, on the other hand, constricts the pupil thus allowing the iris vessels to become stretched, a condition that in itself may act to inhibit secondary hemorrhage.

Jackson contends that atropine is definitely contraindicated, his theory being that since a hyphemia is almost bound to be accompanied by engorgement and edema of the uvea, the filtration angle must be kept open, rather than narrowed by atropine, in order to help in the absorption of the blood in the anterior chamber. O'Neill reminds us of a prime disadvantage of atropine—its persistent mydriasis in the event glaucoma supervenes. He also points out that eserine and pilocarpine contract the ciliary muscle, squeezing the blood from these structures and thereby lessening congestion; and perhaps these drugs may also reduce the probability of secondary glaucoma by pulling on the scleral spur and so opening up the canal of Schlemm.

Thygeson and Beard, while not defending atr pine specifically, say that since ciliary body dan age is a common cause of hyphemia, it would seei wise to use mydriatics as a means of avoiding co traction of the ciliary body, at least for the fir five days after injury.

Bair suggests that both miotics and mydriati are contraindicated because, should continue bleeding be due to an overwhelming vasodilat axon reflex—mediated through the trigeminal f bers and caused directly by contusion—miotics ar mydriatics would only augment this vasodilatatic by producing a capillary dilatation.

Our failure to reach a decision in the choice drugs for use in the immediate post injury peric stems from our lack of a precise understanding the mechanisms of hypophemia. Without dou several factors are involved:

1. The vasodilatation just mentioned.
2. A possible paralysis of the vasoconstrictor mechanis
3. The hypotony phase of the fluctuating tensi found immediately after injury.
4. Perhaps a temporary capillary fragility.
5. And probably others of which we are unaware.

The most important elements of treatment intraocular hemorrhage appear to be: (1) abs lute bedrest for seven days with both eyes ban aged four days, (2) a careful check kept on t intraocular tension, (3) prompt operative inte vention when indicated.

In the literature one finds repeated instances secondary hemorrhage occurring after exertic frequently when the initial hemorrhage was w cleared. Hence absolute bedrest for a week, t period of time during which secondary hemc rhage is possible, seems imperative. Adequate sec tion is also indicated because an agitated, frigl ened or restless patient is capable of consideral exertion.

The indications for paracentesis are seconda or recurrent hemorrhage and/or increased int ocular tension. If paracentesis must be repeat as is often the case with recurrent hemorrha it is recommended that it be done by insertin spatula in the anterior chamber through the or inal paracentesis wound, which is often at temporal limbus. The old practice of removin clot with a forceps or by means of lavage has be abandoned by most of us because of the very r danger of injuring the lens through instrumer tion. Today the procedure of choice is sim paracentesis.

A little pioneering is now being done in non-erative treatment and with considerable success. ıose who avoid operative intervention do so be-use there is undeniable evidence that final vision not as good in the operated case as in the un-erated case. Townes feels that conservatism in atment is the password to success, particularly th young people. He is of the opinion that the ular structures of patients up to thirty or thirty-e years of age are sufficiently elastic to withstand reased intraocular tension for prolonged periods thout running the danger of irreparable damage loss of useful vision. His treatment for young ople with repeated bleeding and secondary glau-ma is well worth reviewing for he has had re-arkable success with it:

1. Absolute bedrest.
2. Adequate sedation.
3. *Infrequent* use of miotics.
4. Pressure bandage of eye.
5. Cold compresses.
6. Vitamin K or cevitanic acid.
7. Intravenous hypertonic solutions.
8. Later, after determining whether vitreous hemor-age has occurred—intravenous iodides.
9. In the presence of persistent glaucoma after hyphe-ia has absorbed and ciliary congestion has subsided, e effectiveness of miotics renewed by the *occasional* e of:
   (a) Suparenin bitartrate, instilled every ten minutes r one hour, and followed by:
   (b) Eserine, instilled every ten minutes for the next our.

Clark of New Orleans has been extremely suc-ssful with a form of treatment that involves a ecial diet, what he calls a dehydration diet. He es this treatment, incidentally, in postoperative emorrhage as well as in initial or posttraumatic traocular hemorrhage—but he emphasizes that is not of value in hemorrhage associated with ascular disease.

The treatment begins immediately after injury hen the patient is given 50 cc. of a 50 per cent ucose solution by vein, and hospitalized. The llowing are then ordered:

1. Absolute bedrest, with eyes occluded, for one week.
2. All fluids and foods stopped immediately.
3. Diet started consisting of 2 ounces of white Karo rup in 3 ounces of fruit juice or water—to be given every three hours during day and every four hours during night, for six or seven days.

   No other food or fluid permitted during this period.
4. Ascorbic acid, 100 mg. by hypodermic, twice daily.
5. Appropriate medications for rest and sleep.
6. If bleeding still active, synthetic vitamin K, 5 mg. by hypodermic.

Dr. Clarke points out that he cannot accurately account for the effectiveness of this dehydration regime but suggests that perhaps a sort of reverse osmosis occurs, with the syrup drawing the fluid, and accelerating the elimination of waste products, from the anterior chamber. Or, he offers, it may be that the dextrose acts in some way to prevent further bleeding. In any case, the results of this treatment have ranged from fair to dramatic, with most of the results deserving to be called "good" and many deserving to be classified as "spectacularly good."

The sequelae of postraumatic intraocular hemmorhage are: (1) degeneration, (2) atrophy, (3) lowered viability, (4) lack of biologic resistance to further insult. All of these plead for an open mind in approaching the task of finding a uniformly effective treatment for this lesion.

In my own experience with seventy-two cases the best results have been obtained by adhering to th conservative methods of treatment. Mydriatics and myotics were not used.

Bibliography

1. Cordes, Fred C., and Horner, Warner D.: Am. J. Ophth., 15:92,1932.
2. Rychener, Ralph O.: Tr. Sect. Ophth., A.M.A., 1944, p. 38.
3. Struble, Golbert C, and Kreft, Alfred J.: War Med., 8:290 (Nov.-Dec.) 1945.
4. Duke-Elder: Textbook of Ophthalmology. Vol. 2, p. 2038. St. Louis: C. V. Mosby Co., 1946.
5. Scott, G. I., and Michaelson, I. C.: Brit. J. Ophth., 30:42 (Jan.) 1946.
6. Fridenberg, Percy: Eye, Ear, Nose & Throat Month., 25:303 (June) 1946.
7. Townes, C. Dwight: Kentucky M. J., 44:264 (Aug.) 1946.
8. Jackson, A. E.: Dallas M. J., 32:113 (Sept.) 1946.
9. Rones, Benjamin, and Wilder, Helenar Campbell: Bull. U. S. Army M. Dept., 6:484 (Oct.) 1946.
10. Laughlin, Robert C.: Tr. Pacific Coast Oto-Ophth. Soc., 1948, p. 133.
11. Clark, William B.: M. Rec. & Ann., 42:596 (Sept.) 1948.
12. Clark, William B.: J. M. A. Alabama, 21:181 (Jan.) 1952.
13. Thygeson, Phillips, and Beard, Crowell: Am. J. Ophth., 35:977 (July) 1952.
14. O'Neill, J. C.: Eye, Ear, Nose & Throat Month., 31:48 (Sept.) 1952.

Metastatic Neoplasms of the Penis

Review of the Literature and Report of Two Cases

M. P. REISER, M.
and C. D. CREEVY, M.
Minneapolis, Minnesc

METASTATIC neoplasms of the penis are rare. Fifty-six cases were collected from the literature: fifteen originated in the bladder, twelve in the rectum, eleven in the prostate, seven in the kidney, six in the testes, two in the lung, and one each in the liver, bone and nasal pharynx. Route of metastasis is either by the lymphatics accompanying the internal pudendal vessels or hematogenous via the dorsal vein of the penis. The corpus spongiosum and the urethra are not usually involved. Priapism occurs in more than one-half of the cases. The outlook is grave.

Surgical treatment has afforded symptomatic relief in six cases. Cattell and Mace[6] reported a metastatic penile lesion two and one-half years after resection of a carcinoma of the rectum; the patient was living without recurrence nine years after amputation of the penis. Boyd's[4] patient was living without recurrence ten months after radical amputation of the penis, and over five years after excision of a carcinoma of the rectum. The patient reported by Niewiesch had local recurrence and generalized metastases six months after partial amputation. Waller and Hellwig[24] reported no recurrence one year after radical amputation of the penis for metastasis from the prostate. Hamm and Weinberg's[13] patient was living ten months following total amputation and orchiectomy for a metastatic penile lesion of the prostate. A metastatic lymphosarcoma from the testes was treated by partial amputation of the penis; the patient was alive ten months later.

Case Reports

Case 1.—E. F. R. S., a sixty-four-year-old white man, was admitted on July 7, 1952. During the past three years, he noticed a progressive increase in symptoms of prostatism, with nocturia one to three times, intermittency, a weak stream and a feeling of incompletely emptying his bladder. During a routine physical examination at the Cancer Detection Center in May, 1952 prostatic nodule was discovered; his referring physici placed him on 100 milligrams of stilbestrol daily.

Physical examination was essentially negative exce for hypertrophy of the breasts and a small prostate gla with an irregular firm right lateral edge with possil periprostatic extension. The residual urine was 85 cul centimeters.

The peripheral blood and urine were normal. Ac phosphatase was 1.7 and the alkaline phosphatase w 12.0 King Armstrong units. The blood urea nitrogen w 16 milligrams per cent. Culture of the urine from t bladder was sterile. Roentgenogram of the chest w normal. Roentgenograms of the urinary tract reveal some small diverticula of the colon filled with bari from a previous barium enema, multiple prosta calculi, and no metastatic lesions of the skeletal syste

On July 11, 1952, cystoscopy revealed a fibrous pr tatic collar; the bladder was trabeculated grade II w numerous cellules. Fifteen grams of prostate we resected with a blood loss of 40 cubic centimeters. prostatic calculi were present in postoperative roentger grams. The pathologist reported carcinoma of the pr tate (Fig. 1). He was placed on stilbestrol 5 milligra daily.

On September 10, 1954, the acid phosphatase w 1.8 and the alkaline phosphatase was 4.3 King Ar strong units. The right lobe of the prostate was ha and smooth whereas the left presented a sizable nod which was hard and fixed. Radiographs showed creased density in the left half of the body of the fi lumbar vertebra as well as a small irregular area slightly increased density in the left pubis—not at typical of metastatic lesions. Because of restriction stream, the stilbestrol was discontinued and Vallest 20 milligrams was prescribed.

On October 6, 1954, despite the Vallestril, he notic a further restriction of his stream as well as an ac in the left buttocks which radiated down the poster thigh and was relieved by moving about. A nod the size of a No. 2 shot was present at the base of t penis. He was placed on 20 milligrams of stilbest daily.

On October 27, 1954, he was admitted, and 2 millicuries of radon were inserted into the prost through perineal needles. The nodule at the base the penis had more than doubled in size. It was sup ficial to the tunica albuginea and freely movable, a was excised together with the adjacent tunica albugin The pathologist reported metastatic carcinoma of t

---

From the Division of Urology in the Department of Surgery, Medical School of the University of Minnesota, Minneapolis, Minnesota.

ostate (Fig. 2). On November 23, 1954, four seeds radon each approximately 1 millicurie were inserted out the periphery of the penile scar. There had been remarkable reduction in the size of the left lobe of prostate. Stilbestrol 20 milligrams daily was rened.

On June 27, 1955, eight months after removel of nodule, he was voiding sparkling clear urine without ficulty. The breasts were hypertrophied, but not der; the prostate gland was broad, flat and fixed h some extension over the right seminal vesicle. There s no recurrence of the penile metastases. Stilbestrol rapy was continued.

On August 29, 1955, he was examined because of n in the lumbar region which radiated along the tribution of the right sciatic nerve. Roentgenograms ealed increased density of the articular facets of the h lumbar vertebra and bilateral pulmonary metastases. e acid and alkaline phosphatases were within normal its. The urine was sparkling clear. The prostate nd was hard and fixed and larger than on the preous examination. There was no recurrence of penile tastasis. Stilbestrol was continued. Irradiation of e lumbar vertebrae afforded relief of his pain.

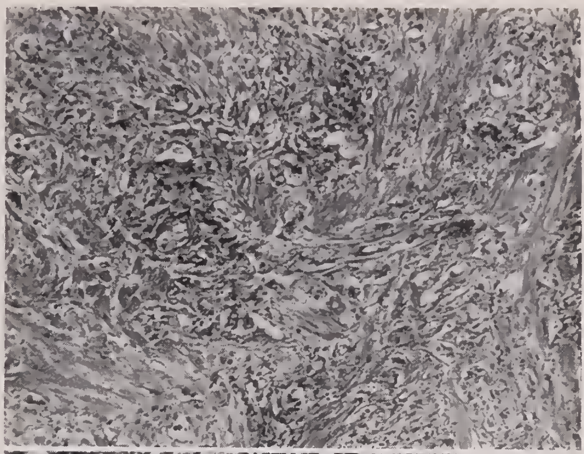
Case 2.—E. H., a seventy-nine-year-old white man, s admitted on February 25, 1954. For the past year, had had progressive symptoms of prostatism, culmiting in acute retention. Diabetes, well controlled with) units of NPH insulin, had been discovered six years rlier. Symptoms of peptic ulcer had been present for e past four years. In 1953, a cerebral vascular accint had resulted in a slight residual weakness of the ft arm and leg.

Examination revealed an elderly male with an ining Foley catheter. There was a little weakness of the ft arm and leg. His blood pressure was 150/70. here were bilateral, lenticular opacities. The heart as enlarged to the left. The prostate was enlarged -plus and was hard and fixed, especially on the left; was very suggestive of carcinoma. The rest of the xamination was essentially negative.

The peripheral blood was normal. The urine conined one plus albumin, two plus sugar and three plus d blood cells. The blood urea nitrogen was 15 millirams per cent; the serum acid phosphatase was 2.1 nd the alkaline 4.6 King Armstrong units. The blood igar was 146 milligrams per cent. A radiogram of e urinary tract did not reveal skeletal metastases; that f the chest disclosed a moderate enlargement of the ft ventricle. An old duodenal ulcer with deformity nd old sealed perforation was present in the gastrontestinal series. Culture of the urine from the bladder as sterile.

Cystoscopy revealed a Grade I median lobe and Grade I lateral lobe hypertrophy. The bladder was trabecuated one plus. Fifty-one grams of prostate were exised with 160 cubic centimeters blood loss. The patholoist reported benign prostatic hypertrophy. The patient as discharged on March 11, 1954.

On May 10, 1954, he was readmitted. For the past wo weeks, he had had chills and fever and a slight initial hematuria. He was afebrile on admission. Weakness of upper and lower extremities was still present. The right seminal vesicle was tense, enlarged and tender; the right lobe of the prostate was tense; the left lobe was normal. There was a moderate periurethritis. The rest of the physical examination was negative.



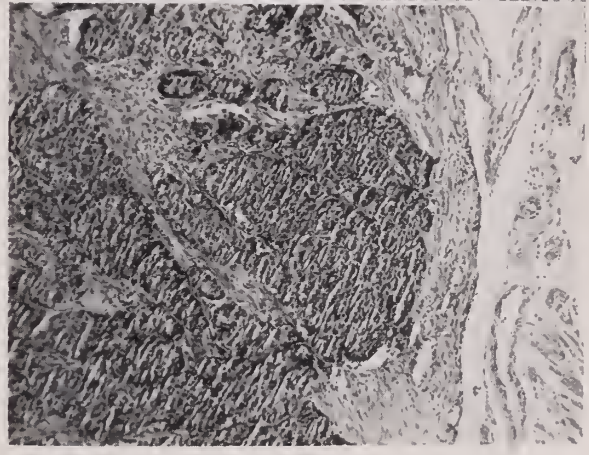


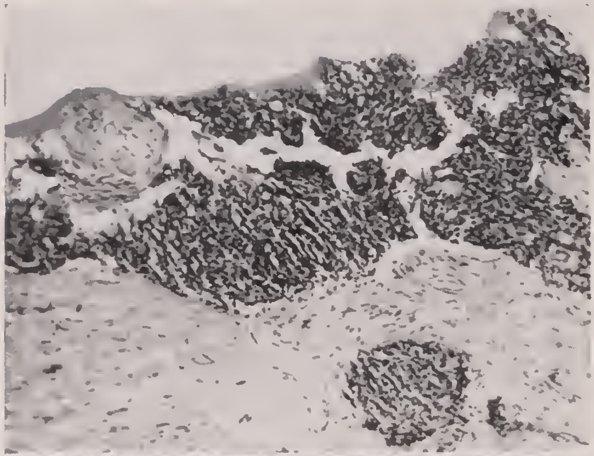
Fig. 1. *(above)* Photomicrograph: carcinoma of the prostate (Case 1).

Fig. 2. *(below)* Penile nodule: metastatic carcinoma of the prostate (Case 1).

The hemoglobin was 14.6 grams; 8,950 leukocytes with a differential count of 85 per cent neutrophils, 12 per cent lymphocytes, 2 per cent monocytes, and 1 per cent basophils. Urine analysis revealed a specific gravity of 1,026, pH 5, 1-plus albumin, 2-plus sugar and 2-plus white blood cells. Culture of the urine from the bladder contained aerobacter aerogenes. Acid phosphatase was 1.8 and alkaline phosphatase 9.2 King Armstrong units. The excretory urogram revealed no skeletal metastases. The kidneys were normal, but the terminal pelvic ureters were slightly dilated.

Cystoscopy disclosed an excellent resection of the prostate gland. He was discharged on Achromycin.

He was readmitted on October 27, 1954, complaining of increased frequency, initial hematuria, and a gradual diminution in the force and size of his urinary stream, associated with episodes of retention necessi-



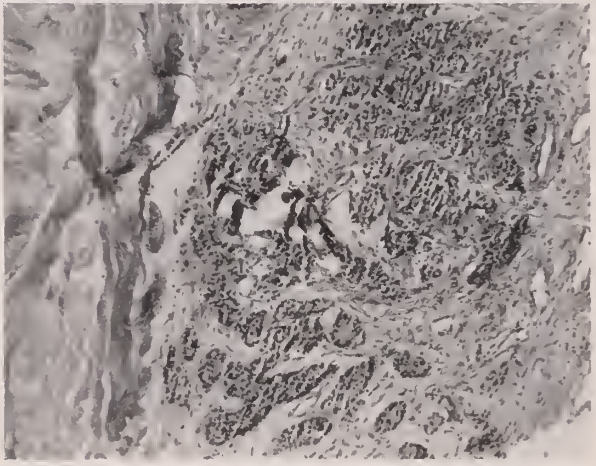


Fig. 3. *(above)* Needle biopsy of the prostate revealing carcinoma (Case 2).

Fig. 4. *(below)* Penile lesion: metastatic carcinoma of the prostate (Case 2).

tating catheterization. There was a pronounced nodular induration along almost the entire ventral aspect of the penis and extending upward in the midportion around the corpora cavernosa. The prostate was hard and fixed. The acid phosphatase was 2.3 and the alkaline phosphatase was 17.4 King Armstrong units. An urethrogram showed a stricture of the midportion of the penile urethra. The prostatic urethra was elongated and there were some small ragged filling defects at its apex. Cystoscopy disclosed necrotic tissue about the apex of the prostate. Biopsies of the prostate and the penis were reported as carcinoma of the prostate with metastasis to the penis (Figs. 3 and 4). A trocar cystostomy and bilateral orchiectomy were done. He was discharged on Stilbestrol, 5 milligrams daily.

On April 4, 1955, he expired elsewhere; the cause of death was hypostatic pneumonia and hemorrhage from a duodenal ulcer. The penile lesion had not increased in size. Necropsy was refused.

Summary

Two additional cases of metastatic carcinoma of the penis from the prostate are reported. This brings the total of secondary malignancies of penis to fifty-eight.

Bibliography

1. Baker, W. J.: Discussion of study of the blad tumors in the registry of the American Urolog Association. Dean, A. L., and Ash, J. E.: J. Ur 63:622, 1950.
2. Berard, L. N., and Byrne, J. E.: Priapism due unusual metastasis from bladder carcinoma; c report. J. Urol., 70:261, 1953.
3. Bowersox, W. A., and Frerichs, J. B.: Adenoca noma of the colon with primary complaints of tur of penis: report with considerations of mode occurrence. J. Urol., 68:897, 1952.
4. Boyd, H. L.: Metastatic carcinoma of the pe secondary to carcinoma of the rectum: a review the literature and report of a case. J. Urol., 71: 1954.
5. Burrell, N. L.: Priapism due to metastatic hyp nephroma in corpora cavernosa of penis. J. Ur 60:636, 1948.
6. Cattell, R. B., and Mace, A. J.: Metastases to penis from carcinoma of the rectum. J.A.M 146:1230, 1951.
7. Cowie, D. M.: A case of priapism resulting fr rapidly spreading myxosarcoma with general metastases. Trans. Am. Ped. Soc., 32:198, 19
8. Espinosa, R. R.; Mahoney, M. T., and Alba E. N.: Secondary carcinoma of the penis w primary site in prostate gland. Am. J. Clin. Pa 24:1165, 1954.
9. Fort, C. A.; Bailey, M. K., and Kicklighter. J. Primary carcinoma of bladder with secondary tastases to penis. J. Urol., 66:238, 1951.
10. Froin, G., and Pignot, J.: Cancer du testicle a metastases dans les visceres et les corps caverne du penis. Bull. et Mem. Soc. Anat., 85:975, 19
11. Frontz, W. A., and Alyea, E. P.: Priapism unusual etiology. Case report. J. Urol., 20:1 1928.
12. Haas, A., and Ritter, S. A.: "Benign" giant tumor of femur with embolic metastases in prep of penis. Am. J. Surg., 89:573, 1955.
13. Hamm, F. C., and Weinberg, S. R.: Second malignant infiltration of penis: report of f cases, two with surgical treatment for palliati J. Urol., 73:349, 1955.
14. Henderson, D. St. Clair L.: A case of persist priapism secondary to a transitional cell carcino of the left kidney. Brit. J. Urol., 22:223, 19
15. Kerr, H. D., and Gillies, C. L.: The urinary tr A handbook of roentgen diagnosis. Chicago, I The Yearbook Publishers, Inc., 1944, p. 298.
16. Klinger, M. E.: Secondary tumors of the gen urinary tract. J. Urol., 65:144, 1951.
17. Markson, L. S.; Stoops, C. W., and Kanter, Metastatic transitional cell carcinoma of the pe simulating a chancre. Arch. Dermat. & Syp 59:50, 1949.
18. Melicow, M. M., and Ganem, E. J.: Cancer and precancerous lesions of the penis: a clinical pathological study based on twenty-three ca J. Urol., 55:486, 1946.
19. Musiani, U.: Della rarita delle metastasi carci matosenei corpi cavernosi del pene. Urolo 12:94, 1947.
20. Ney, C.: Secondary carcinoma of the penis aris from carcinoma of the rectum. A.M.A. Arch. Su 65:783, 1952.
21. Poutasse, E. F.: Metastasis to the penis: report four cases. J. Urol., 72:1196, 1954.

(Continued on Page 456)

amilial Absence of Mesenteric Plexus as a ause of Bowel Obstruction in the Newborn

ELDON BERGLUND, M.D.
WILLIS H. THOMPSON, M.D.
and TAGUE C. CHISHOLM, M.D.
Minneapolis, Minnesota

THE basic intestinal disturbance in the disease called congenital megacolon, or Hirschsprung's sease. has been clarified in recent years. Papers ıve appeared reporting abnormalities of the ınglial cells of Auerbach's myenteric plexus of ıe large bowel. In 1940 Tiffin et al[1] advanced ıe proposition that the real defect in congenital ıegacolon was the absence of the myenteric plexus ı portions of the colon. This absence of the lexus produced a physiological obstruction. Later, hitehouse and Kernohan[2] of the Mayo Clinic ıade careful autopsy studies of eleven cases of ongenital megacolon and found the Auerbach lexus missing in the terminal portion of the colon. ll of their cases concerned persons who had lived eyond infancy. Swenson[3] and his co-workers exended this knowledge and put it to practical pplication in the development of the modern surical treatment for congenital megacolon.

The form of the disease which is seen in ages eyond infancy could be called *chronic* congenital negacolon. The form which presents itself as ntestinal obstruction in the newborn, on the other and, could be called *acute* congenital megacolon nd it is with the latter form that we are conerned here. The basic defect in the two forms of he disease, that is, the deficiency in Auerbach's lexus, is the same. The *difference* in the two orms of the disease is that the acute form is more xtensive and severe so that the newborn child annot live without surgical correction. Another pparent difference is that the acute form may be nanifest as a familial disease. The literature on hronic congenital megacolon does not stress its ccurrence as a familial disease, while the occurence of the acute form as a familial disease is triking. Zuelzer and Wilson[4] in 1948 reported leven cases of acute congenital megacolon with bstructive symptoms in the first few days or weeks of life. Five of their cases were siblings of one family. Nine of their patients died early in infancy; two survived with colostomies. Forshall et al[5] in 1951 reported the occurrence of this disease in four siblings, all of whom died in the first days or weeks of life. An aunt of these children probably had congenital megacolon also. Bodian[6] in 1951 reported the occurrence of the disease in both the acute and chronic forms in siblings of three families. As early as 1924 Dalla Valle[7] wrote of two siblings each of whom died in late infancy with obstructive symptoms and with absence of Auerbach's plexus in the distal colon.

The treatment of acute congenital megacolon prior to the past few years was very unsatisfactory. The most common error was to mistake the condition for atresia of the bowel or to blame the obstruction on adhesions. In the latter instance, the surgeon would be misled because the colon would be found to be patent, allowing for the expression of meconium and air. No definitive treatment would be given and the child would usually expire. Occasionally a colostomy would be done, allowing temporary relief. In 1952, Potts[8] emphasized the importance of applying Swenson's technique for the correction of chronic congenital megacolon to the correction of acute congenital megacolon.

Case Reports

The following seven cases, four of them siblings from one family and three of them siblings from another family. illustrate the clinical picture and the familial nature of the disease.

Case 1.—Baby Boy C., weight 9 pounds 3 ounces, was born June 5, 1938, at Swedish Hospital in Minneapolis. There was an onset of vomiting at three days of age. A meconium stool was recorded. An operation was done at eight days of age. The ileum was distended to within two inches of its juncture with the cecum. The obstruction was thought to be due to adhesions at this point. They were released but the child died the same day. At autopsy, no atresia or obstruc-

---

Presented before the Northwest Pediatric Society, ctober, 1955.

tion was found. No microscopic examination of the colon was made.

Case 2.—Baby Boy C., weight 10 pounds 4 ounces, sibling of Case 1, was born on March 28, 1940. at Asbury Hospital. The baby vomited and had a distended abdomen on the second day of life. A barium enema was done (Fig. 1). The baby was operated upon on the third day of life. The ileum appeared to be constricted with congenital bands, which were released. There was free blood in the peritoneal cavity. The baby died the following day. Autopsy showed narrowing of the ileum from the ileocecal valve to a point 15 cm. proximal. The bowel was distended above this point. A microscopic section of the colon is shown (Fig. 2). A section of normal colon is shown for comparison (Fig. 3).

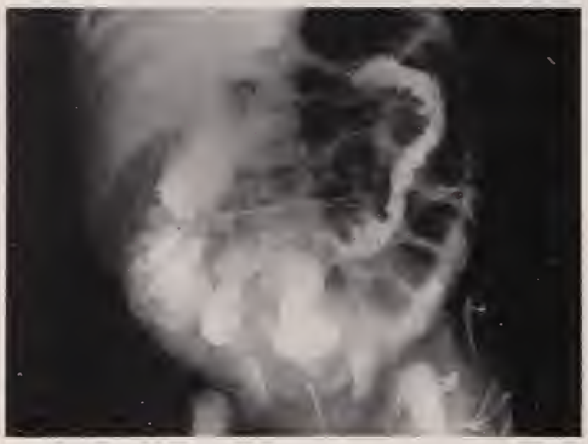
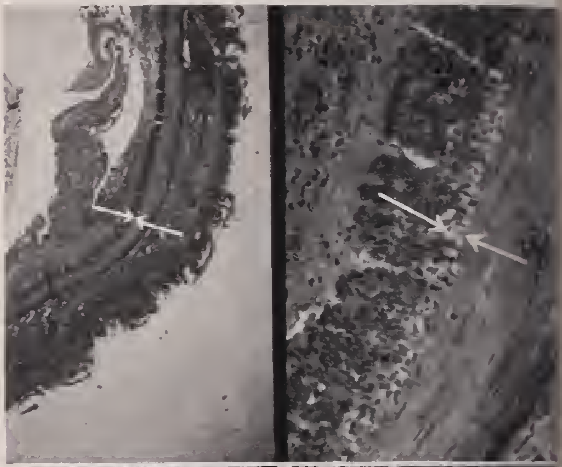


Fig. 1. Case 2. Barium enema showing the narrowed distal colon in the rectosigmoid area.

Case 3.—Baby Girl C., weight 8 pounds ½ ounce, a sibling of Cases 1 and 2, was born on February 23, 1941, at St. Barnabas Hospital. Projectile vomiting occurred on the fourth day. A brown mucoid stool was passed on the eighth day. An x-ray at that time showed an obstructive lesion in the mid-portion of the transverse colon, but barium could be forced beyond this point to the proximal colon. Barium given by mouth passed only to the terminal ileum. An operation on the eighth day showed hemorrhage from the posterior aspect of the cecum and a partial volvulus at the hepatic flexure. No obstructive site could be found: no definitive treatment was done. The baby had a stormy postoperative course and died nineteen days after operation. At autopsy the small bowel was distended and hypertrophied. The cecum was perforated and collapsed. No atresia or area of mechanical obstruction could be found. No sections of the bowel are available.

Case 4.—Baby Girl Frances C., weight 9 pounds 11 ounces, a sibling of Cases 1, 2 and 3. was born on January 17. 1946. at St. Barnabas Hospital. (A different doctor delivered each of the babies.) The abdome was moderately distended. Meconium was obtained o rectal examination. An x-ray showed distention of th small bowel with no visible air in the colon. At opera tion on the second day of life, there was distention o the small bowel and ascending colon and the first hal



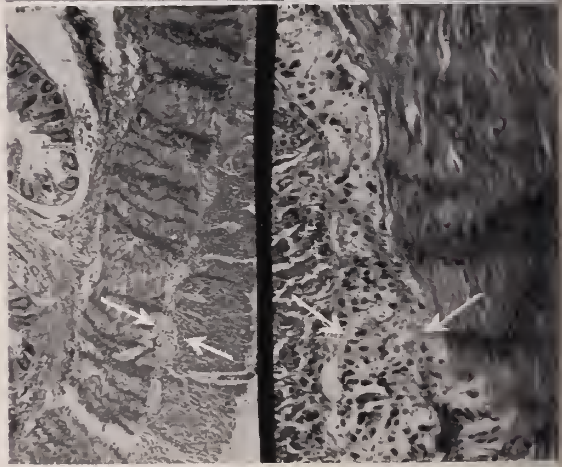


Fig. 2. *(above)* Case 2. Low power view (left) an high power view (right) of section of colon obtaine at autopsy. Auerbach's plexus should lie between th longitudinal and circular muscle bundles, but is absen Compare with Figure 3.

Fig. 3. *(below)* Section of a normal colon from a infant. Auerbach's plexus can be seen as nests of cel lying between the longitudinal and circular muscle bun dles on the left (low power). The individual large dar staining cells can be seen in the high power view o the right.

of the transverse colon. The fluid contents of the bow could be expressed into the distal colon. The baby d three days after operation. At autopsy the cecum w perforated; the distal colon was not distended and a peared normal. The single section of the bowel which available shows no ganglia cells (Fig. 4).

This family then stopped having children. They h one normal daughter born before these babies report here.

ase 5.—Baby Gregory O. was the fourth child born his parents. The three previous siblings were normal ldren with no problem of constipation. There was history of Hirschsprung's disease or of severe conpation in any relative. This baby was born September 1951, and weighed 8 pounds. There were no stools or the first three days, and the abdomen became disended. An enema produced a moderate amount of dark vatery stools. A barium enema was done (Fig. 5). omiting started on the fourth day. Despite suction he distention persisted. Operation was performed on he eighth day. There appeared to be an obstruction of he jejunum represented by an indentation of the wall f the jejunum. However, when the bowel was opened o septum or atresia was found. The remainder of the owel, large and small, appeared normal. The postperative course was good. Stools were passed and veight was gained. The child was discharged at about two weeks of age. After five days at home the child was readmitted in state of shock and dehydration. He died a few hours later. At autopsy a fibrinous dry peritonitis was found. The bowel was distended and necrotic, all matted together. No actual site of obstruction was found.

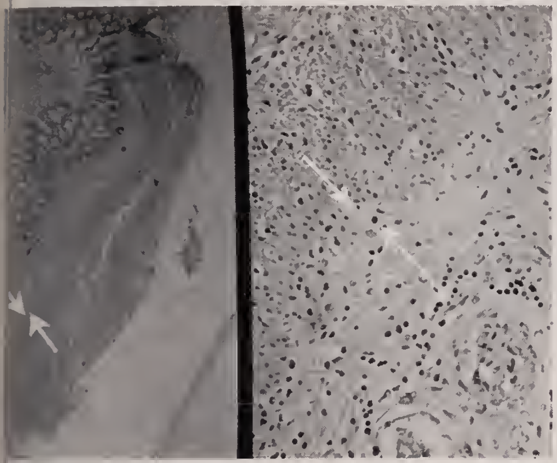


Fig. 4. Case 4. Section of colon showing absence of erbach's plexus. Low power on left. High power on ht.

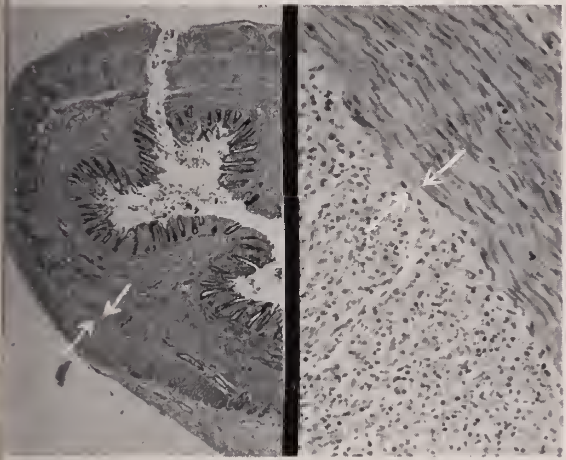


Fig. 6. Case 6. One of serial sections taken from the olon showing absence of Auerbach's plexus. Low power n left. High power on right.

Case 6.—Scott O., a sibling of Case 5, was born on May 5, 1953. Abdominal distention and vomiting occurred about sixty hours after birth. An x-ray indicated obstruction so operation was done on the third day of life. At operation there appeared to be a herniation of the distal ileum through a rent in the mesentery at the ileo-cecal junction. The entire colon was abnormally small. The herniation was corrected. Some stools were passed about one week postoperatively but on the fifteenth postoperative day the distention was so great that re-exploration was done. Adhesions were found; the small bowel was distended; the colon was still small and empty. An ileostomy was done but the baby died the following day. At autopsy the small bowel was distended; the colon was small—at no point more than 18 mm. in circumference (Fig. 6). Serial sections showed that Auerbach's plexus was missing from the entire colon.

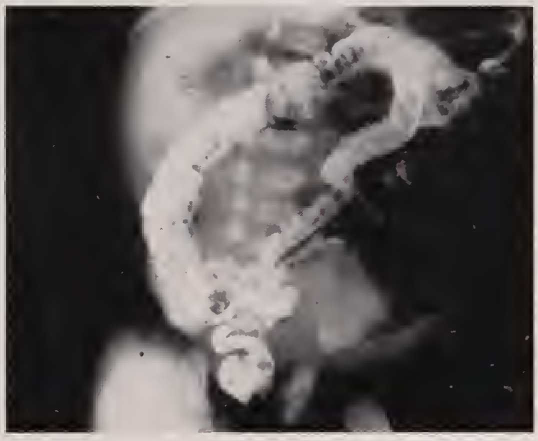


Fig. 5. Case 5. Barium enema showing narrowed rectosigmoid area.

Case 7.—Keith O., a sibling of Cases 5 and 6, was born March 29, 1955. Birth weight was 7 pounds 6 ounces. The child started to vomit soon after birth, the vomiting becoming fecal in nature. No stools had been passed when he was first seen at thirty hours after birth. A rectal examination produced a mucous plug and some meconium, but the abdominal distention was not relieved. A lipiodal enema was done (Fig. 7), showing a narrow distal colon. This was confirmed at operation done on the second day of life. A transverse colostomy was done. The postoperative course was complicated by a staphylococcus septicemia, but the baby is now thriving at ten months of age. He has normal stools through the colostomy, which was fitted with a bag. It is

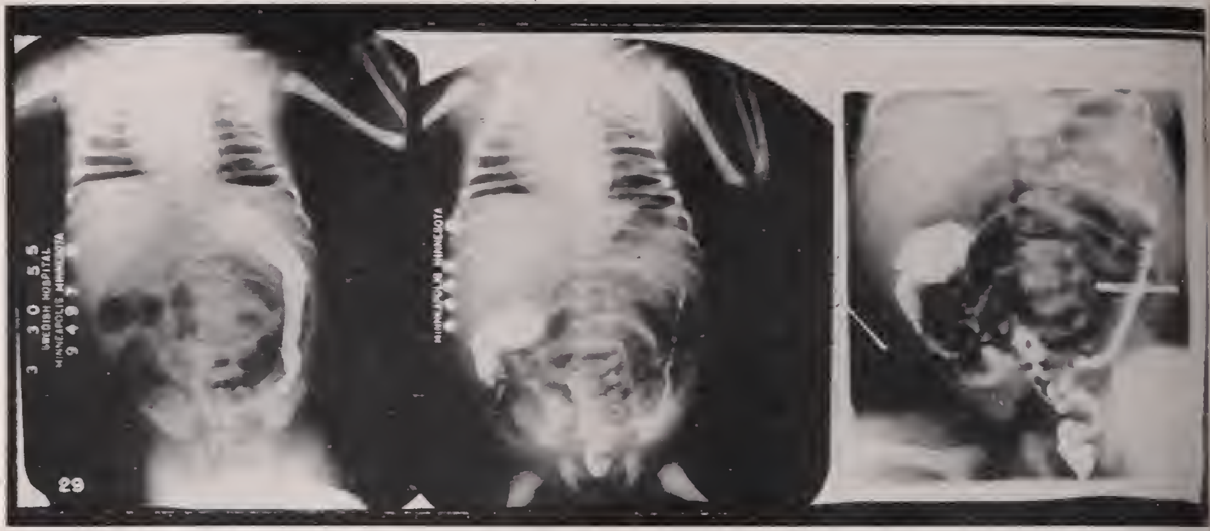


Fig. 7. Case 7. Three views of a lipiodal enema showing the narrowed distal colon. A mid-transverse colostomy has functioned well in this infant.

our plan to do a Swenson pull-through anastomosis at about one year of age. An incidental finding in this baby is a coloboma of the iris of the right eye.

In retrospect, it would appear that three of the babies in the first family might have survived with a colostomy. The others in this series of seven appeared to have all the colon or part of the small bowel involved and probably would not have survived any procedure.

Discussion

We think it is important to emphasize that the syndrome of acute congenital megacolon be considered in any bowel obstruction in the newborn infant. If no other cause for the obstruction can be found, and if a portion of the bowel is dilated and a more distal portion appears narrowed or even normal, then acute congenital megacolon is a sound presumptive explanation.

Potts recommends that a primary anastomosis be done if the baby's condition is good. The narrowed segment, usually distal colon and rectum, should be removed as well as any part of the dilated colon which is deficient in Auerbach's plexus. The help of a pathologist with frozen sections is needed, of course, to determine the extent of surgical excision. If the condition of the baby is not good or if the technical problem appears to be too great at the moment, a transverse or descending colostomy can be done and the final anastomosis done later. The temptation to close the abdomen without a definitive procedure (particularly in the presence of "congenital bands"), in hopes that things will work ou should be resisted. The recorded experience wou indicate that such babies will not survive.

Summary

A series of seven cases of congenital megacolo causing bowel obstruction in the newborn infar is reported. Four of the infants were siblings c one family, three of them were siblings of anothe family. One baby of the seven survived. Th importance of recognition of this syndrome stressed. The pathology and the treatment c acute congenital megacolon are discussed.

References

1. Tiffin, M. E.; Chandler, L. R., and Faber, H. K. Localized absence of the ganglion cells of the myer teric plexus in congenital megacolon. Am. J. Di Child., 59:1071, 1940.
2. Whitehouse, F. R., and Kernohan, J. W.: Myer teric plexus in congenital megacolon. Arch. In Med., 82:75, 1948.
3. Swenson, O., and Bill, A. H., Jr.: Resection rectum and rectosigmoid with preservation of th sphincter for benign spastic lesions producing meg. colon. Surgery, 24:212, 1948.
4. Zuelzer, W. W., and Wilson, J. L.: Functional in testinal obstruction on a congenital neurogen basis in infancy. Am. J. Dis. Child., 75:40, 194
5. Forshall, I.; Rickham, P. P., and Mossman, D. B Functional intestinal obstruction in the newbor Arch. Dis. Child., 26:294, 1951.
6. Bodian, M.; Carter, C. O., and Ward, B. C. H Hirschsprung's disease. Lancet, 1:302-309 (Fe 10) 1951.
7. Dalla Valle, A.: Richerche istologiche su di un megacolon congenito. Pediatria, 28:740-752, 192
8. Potts, W. J., Boggs, J. D., and White, H.: Inte tinal obstruction in newborn infant due to agen sis of myenteric plexus (congenital megacolon Pediatrics, 10:253-264 (Sept.) 1952.

larmful Effects of Interpretive Psychotherapy n Certain Involutional Depressions

GORDON R. KAMMAN, M.D.
Saint Paul, Minnesota

THE point of departure of this paper is the hypothesis that, broadly speaking, there are o kinds of individual psychotherapy: (1) ex- essive or deep, and (2) suppressive or supportive erapy.[1] Expressive therapy is designed to ex- ore and elucidate the emotional conflicts that e unknown to the patient but which cause symp- ms. It employs analytic techniques such as ploration, abreaction, free association and *inter- etation.* Suppressive therapy relies mainly upon o strengthening measures and employs reassur- ice, encouragement, explanation of symptoms at more superficial level, and so forth. Of course, both kinds of psychotherapy transference plays very important part.

My thesis is that there are certain depressions in hich expressive therapy with interpretation is zardous and at times even harmful. These de- essions are the ones generally known as the in- lutional depressions. Whether the involutional pressions are endogenous or constitutional—have external precipitating factors—or whether they e largely reactive—have external precipitating uses such as excessive environmental stress—is batable. Insofar as an individual can compen- te for external threats until he has reached the volutional period of life and that with the onset the climacteric he may no longer be able to ef- ctuate these compensations, the depression may said to be reactive.

Depressive emotional responses can occur at rious levels, depending upon the inner dynamic ructure of the patient's personality. However, I not subscribe to the Lockean view that the mind a tabula rasa on which experience writes all at is later to exist. I lean toward the Leibnitzian eory that the mind has an active core of its vn. Therefore, even the "reactive" depressions all probability have an intrinsic factor. All per- nalities have the capacity to transcend the im- ediate moment, to make decisions in long-range terms, and they have the elements of freedom and responsibility for ethical living. Consequently, there is no such thing as a purely reactive depression. There always is an endogenous factor.

The first of these endogenous factors is heredity. Franz Kallmann[2] concludes that "the recurring ability to exceed the normal range of emotional responses with extreme but self-limited mood alterations seems to be associated with a specific neurohormonal disturbance which depends on the mutative effect of a single dominant gene with incomplete penetrance. The dynamics identified with this specific ability cannot be considered to be part of a person's normal biological equipment nor are they out of line with current concepts of psychodynamic phenomena as observed in potentially vulnerable persons. Further, the ostensible occurrence of a gene-controlled tendency to excessive mood swings in adults shows evidence of the existence of a regulative mechanism, which ordinarily serves to protect man's emotional life from harmful extremes of affective responses. Obviously, this protective device is also determined by heredity, that is, by the physiological effect of the normal allele of that mutant gene capable of producing the symptomatology of a cyclic psychosis." Later, Kallmann says, "The range of manifest symptoms observable in twin partners and siblings of manic-depressive patients offers an essential criterion for distinguishing the usual symptomatology of manic-depressive psychosis from those of other clinical entities. More specifically, one may say that the understanding of various psychiatric problems related to the etiology of depressive phenomena is likely to improve, if it can be based on a consistent and genetically confirmed system of diagnostic classifications."

The second endogenous factor is endocrine imbalance. Reiss[3] of Bristol, England, reminds us that (1) many ductless glands have a direct influence on the brain metabolism and therefore on different phases of mentation; (2) every psychic trauma or serious psychological disturbance has an

---

Read before the Mid-Continent Psychiatric Association Tulsa, Oklahoma, on September 24, 1955.

influence on the function of the ductless glands; (3) it is difficult to think in terms of primary and secondary phenomena when investigating a psychopathologic-endocrine problem since the problem is only confronted when the pathological process is already advanced and a vicious circle has been developed. However, Reiss' work indicates that changes in the total hormone equilibrium show a closer correlation to disturbed mentation than do the changes in the functions of a single gland.

Fabing[4] in discussing the chemotherapy of certain psychoses refers to a number of psychonoxious drugs known to the Germans as the "phantastica" and, more recently, as the "hallucinogens." In his study of these drugs Fabing found that an indole nucleus is common to their chemistry. The substances of vegetable origin include LSD-25 from rye rust, yohimbine, mescaline, and others. There also are hallucinogens of animal origin. These include tryptamine, bufotenene, adenochrome (pink adrenalin), and others. Although these drugs cause schizophrenic-like reactions and do not seem to enter into the production of depressions, in my opinion it is conceivable that other chemical compounds not yet discovered are in some way involved in the causation of depressive reactions. Depressions so caused would, of course, be considered endogenous.

In the involutional depressions we probably are dealing with a combination of endogenous and exogenous factors. The proportion in which each of these factors exists varies with the individual case. However, there is a certain tendency toward polarity, and through a careful evaluation of each patient one should be able to ascertain which factor predominates.

In addition to the usual psychiatric interview, some of the psychometric tests have been very helpful aids in determining what type of psychotherapy should be used in each case. I have found the Rorschach test to be very helpful to both patient and therapist. With this test it is usually possible to ascertain how much of a neurotic (reactive) component and how much of a so-called intrinsic or endogenous component exists in each case. A discussion of the Rorschach variables in this connection does not come within the scope of this paper. Another important psychometric test is the Wechsler-Bellevue. The merit of this test lies in the fact that a knowledge of the amount of intelligence a patient has is necessary before a psychotherapeutic program can be set up. As has been pointed out,[5] "people of dull normal intelligence who are not sophisticated will respond to reassurance and to suggestive therapy, which to a more intelligent person would appear as nothing more than hocus-pocus. By the same token, if a patient has a high normal or superior intelligence, it is possible to treat him with a more penetrating approach." However, when we are dealing with the involutional depressions, an interpretive and penetrating approach may do more harm than good.

I refer especially to those depressions in which retrospective self-accusation is a prominent symptom. Guilt about masturbation and other fancied sexual misadventures should be dealt with in a suppressive way. To explore, analyze, and interpret the dynamics of these guilt reactions in people suffering from involutional depression may mobilize more anxiety than the patient can handle and tend to increase the depression. I am speaking now of the depressions in which the intrinsic factor predominates. A very brief case report might illustrate my point.

B.W., a forty-seven-year-old white male executive was referred for treatment of a depression. He had the classical symptoms of psychomotor inhibition, low point in the morning, crying spells, loss of interest, feelings of hopelessness, and occasional suicidal fantasies. In addition to these he had strong guilt feelings about having continued to masturbate after he was married at the age of twenty-seven. These guilt feelings were intensified by the fact that the patient's masturbatory fantasies had had a strong homosexual tinge.

A psychotherapist who had treated the patient for a year before we saw him had permitted the patient tc spend many interview hours ventilating his guilt. The therapist then made the mistake of trying to interpret tc the patient his homosexual fantasies. Latent homosexuality, mother identification, incest wishes, and a number of other psychonoxious mechanisms were illumed and as time went on the patient got worse. He became more self-accusatory, he was convinced that he was a "queer" and he attempted suicide by cutting his wrist This led to hospitalization and a change of doctors. Th patient was given eight electroshock treatments, psycho therapy was carried out at the level of reassurance an ego strengthening, the patient was told that what he ha done twenty years ago could not cause his present de pression, the psychobiology of the hormonal system wa explained to him, and after ten weeks of treatment th patient was discharged as having recovered.

I am certain that all psychiatrists have see many cases similar to the one just described. An other point that comes to mind is that these pa tients respond much better to directive than t ndirective therapy. We all have seen patients ho, after having been subjected to non-directive erapy complain that "the doctor never *told* me ything." For the therapist to sit back passively d allow the patient to talk at random and for e therapist occasionally to utter a semi-directive terpretation which may be apprehended by the tient in any one of a number of ways could be zardous. We all have seen patients in whom inlutional depression has been treated non-direcvely and who have a feeling similar to that of a rson who stands with both feet firmly planted mid-air.

Devotees of the analytic school sometimes assert at, while many psychiatric conditions may reond to a non-analytic approach, whatever adstment the patient makes is only temporary and ere will be a recurrence. Clinical experience has ught that as far as the involutional depressions hich make their first appearance in midlife are oncerned, recurrences are relatively uncommon egardless of the type of psychotherapy employed. et it be understoond that I am not opposed to nalytic orientation *per se*. Having been trained n an analytic milieu, I am not unmindful of the alue and benefits of analytic knowledge. In many sychiatric disorders other than involutional deressions the analytic approach and interpretation s the best therapy.

What I have just said applies to the true inolutional melancholias as well as to the depresions of the manic-depressive type. We also inlude the so-called catathymic depressions—reacions in which there is a harping on one set deressive topic and not as much mood displacement s one finds in the so-called involutional melanholias. Even when we treat depressions with proounced somatazation reactions, it sometimes is azardous to get too deeply into interpretive herapy. However, it usually is quite safe to exlain to the patients the effect of conditioning, he pathophysiology of the psychosomatic disorders, and to desensitize them on the matter of guilt feelings that they might be "putting on" or "imagining" their symptoms. In cases where omatazation reactions predominate, the fewer medications used the better. To fill a patient up with a variety of sedatives and the entire gamut of the newer wonder drugs merely tends to fix the patient's attention on the somatic aspects of his problem. By the same token, it is hazardous to delve too deeply into unconscious conflicts and to bring to the surface material that is psychonoxious. In depressions where paranoid thinking plays a prominent part, the psychotherapist must be extremely careful in interpreting the paranoid reactions to the patient. In most cases it is wiser and safer to stay away from any interpretation of latent homosexual wishes and their projections. Diethelm[6] states, "A thorough analysis for possible dynamic factors should be delayed until the depression has cleared up. Delusions of sin, especially in the sexual field, and guilt to actual past misdemeanors are viewed similarly. One should, however, always offer an opportunity for discussions which are terminated by constructive formulation." In other words, suppressive therapy should not be carried to the point where the psychotherapist completely ignores the patient's complaints. To tell the patient to forget it and that there is nothing wrong with him and then to prescribe a little more bromide is anything but good therapy.

If patients have religious scruples, it is usually well to have pastoral counseling. However, it must be remembered that the clergyman is not a healer. He is a helper and should work in cooperation with and under the supervision of the attending physician. While it is usually preferable that the assisting clergyman has some psychiatric orientation, I have found a number of clergymen who have an almost instinctive knack for helping people. The wise counselor will avoid too deep penetration into the philosophical aspects of the patient's religious preoccupations. He must be just as careful to guard against mobilizing guilt reactions as is the psychotherapist.

In some of the late involutional depressions, patients engage in deviations from the culturally acceptable patterns in the sexual sphere. It was formerly believed that these sex perversions in elderly persons were evidences of ethical deterioration on the basis of brain degeneration. However, we see many cases in which there is no evidence of deterioration (normal test results in the battery of psychometric examinations that we use as well as close clinical observation), and we feel that in cases where the patient has entered into biologically or socially forbidden channels, there has been a regression to infantile levels of gratification.[7] In the treatment of this particular aspect of the depressions it is safe to interpret to the patient the mechanism of regression. In fact, when the patient is able to realize what really is taking

(Continued on Page 458)

ACTH and Cortisone in Agranulocytosis

J. S. BLUMENTHAL, M.D
Minneapolis, Minnesot

THE very multiplicity of therapeutic agents used in agranulocytosis speaks for their lack of specificity and efficacy—pentnucleotide, folic acid, vitamin B_{12}, blood, BAL, et cetera.[4,10] This is so, irrespective of the cause—arsenicals, gold, dinitrophenol, aspirin, benzol, sulfa, aminopyrine, et cetera.[3,8,12,13] They do not affect the underlying pathological physiology, the maturation arrest of the precursors of granulocytes in the bone marrow. Administration of pentnucleotide may be followed by remarkable improvement, and immature granulocytes and monocytes may begin to appear in the peripheral blood with a rise in the total leukocyte count; however, the latent period between administration and evidence of improvement makes evaluation very difficult.[5] Indeed, a great many failures have been reported. Even instances of recovery may have been due to purely physiological factors rather than to the drug.

In recent years antibiotics have greatly aided in treatment by protecting the patient against infection during the period of recovery from sensitivity to the causative agents.[6,9,14] With the advent of ACTH and cortisone, which stimulate the bone marrow, it was natural that these hormones should be used in the usually self-limited sensitization phenomenon of agranulocytosis.[7]

A fifty-six-year-old woman was admitted to St. Andrew's Hospital on October 31, 1951, because of fever, sore throat, general malaise, prostration, nausea and vomiting. The present illness began during the first week in September when she noted a severe sore throat. She was hospitalized and treated elsewhere with large doses of penicillin and streptomycin, with no effect, from September 7 to 10. Her temperature reached 106° and she became semi comatose. On September 10 she received sulfonamides in the form of three pan-sulfa tablets every four hours. Each tablet contained 2.5 grains each of sulfamerazine, sulfadiazine and sulfacetamide. This medication was effective, and on September 14 she left the hospital. The white count was 6,500 on admission and 4,300 on discharge with a normal differential count on both occasions. Cultures from mouth and throat revealed mixed bacteria with no predominance. On September 21 she was see again by her private physician, and while she still ha a herpetic lesion on her lip, her condition was gooc At that time her white blood count was 8,050, agai with a normal differential. The patient had no furthe symptoms until one week prior to admission to th hospital when she ran a nail into her left palm. Fo lowing this there was a gradual recurrence and exacei bation of her original complaints. She denied takin any medication except Anacin and aspirin in larg amounts (two to three tablets every two to three hours

She had had stiffness and pain in her fingers an knees for many years, for which she took aspirin an Anacin. She had also tried a great many differer "shots" with no benefit. She had received none sinc the present illness started. She had had acute hive in June, 1951, due to undetermined cause. The famil history was not remarkable.

When first seen in consultation on November 1, 1951 the patient was moribund. Her temperature was 105 pulse rate 135, and respirations 35. The mucous mem branes of the mouth and throat were covered by thick, grey membrane. She was unable to give th history. White count was 450 on admission, Octobe 31, and 400 the next morning. All cells were lymphc cytes. The sedimentation rate was 123 mm. in one hou hemoglobin 11.3 gm. per 100 cc. (77 per cent) an red cell count 4,000,000. Blood pressure was 90/6 On the morning of the second hospital day she ha already received 2,000,000 units of penicillin intra venously and 400,000 units every four hours intramus cularly, as well as streptomycin 0.5 gm. twice daily without apparent effect.

Because death seemed imminent and no evaluatio could be made as to the status of the adrenals, bot ACTH and cortisone were started in spite of the wel known apparent effects of these agents on immunit and the possible antagonism of ACTH and cortisone That the immunity-reducing effect is only apparent substantiated by the fact that the steroids actually ir crease effectiveness of treatment with antibiotics in cor ditions such as brucellosis. Further, a high corticoi level is not incompatible with high ACTH output shock and stress.[2] Moreover, I believed the antibiotic would cover any decrease in antibody titre. ACT was given in 25 mg. doses every six hours, and cor sone was given intramuscularly, 300 mg. the first da 200 mg. per day on the second and third days, an 100 mg. daily thereafter. The dose of both ACT and cortisone was gradually reduced, as was that penicillin and streptomycin, as the dramatic respon of the patient warranted (Table I and Fig. 1) ar the blood picture dictated.

From the Allergy Clinic, Department of Internal Medicine, University of Minnesota.

TABLE I.

ate	Hemoglobin	Red Blood Cells	Leuko-cytes	Neutro-philes	Lympho-cytes	Monocytes	Penicillin	Streptomycin	ACTH	Cortisone
/31/51	77% (11.3)	4,000,000	450		100%		2,000,000 IV. 1,600,000	1 gm.		
/1/51			400		100%		1,600,000	1 gm.	100 mg.	300 mg.
/2/51			400	8	88%	4	1,600,000	1 gm.	100 mg.	200 mg.
/3/51			2,550	34	64%	2	1,600,000	1 gm.	60 mg.	200 mg.
/4/51			8,150	38	62%		1,600,000	1 gm.	60 mg.	100 mg.
/5/51			12,550	40	60%		1,600,000	1 gm.	60 mg.	100 mg.
/6/51			14,950	61	36%	3	1,600,000	1 gm.	40 mg.	
/7/51			20,750	65	35%		1,600,000		40 mg.	
/8/51			23,200	68	32%		1,200,000		40 mg.	
/9/51			21,350	70	30%		800,000		20 mg.	
/10/51			27,000	82	18%		400,000		10 mg.	
/11/51			14,000	69	31%		400,000		10 mg.	
/12/51			12,600	70	28%	2	400,000			
/13/51			8,500	76	24%		400,000			
/14/51			7,400	76	24%					
/15/51			7,300	58	42%					
/16/51			6,600	73	27%					

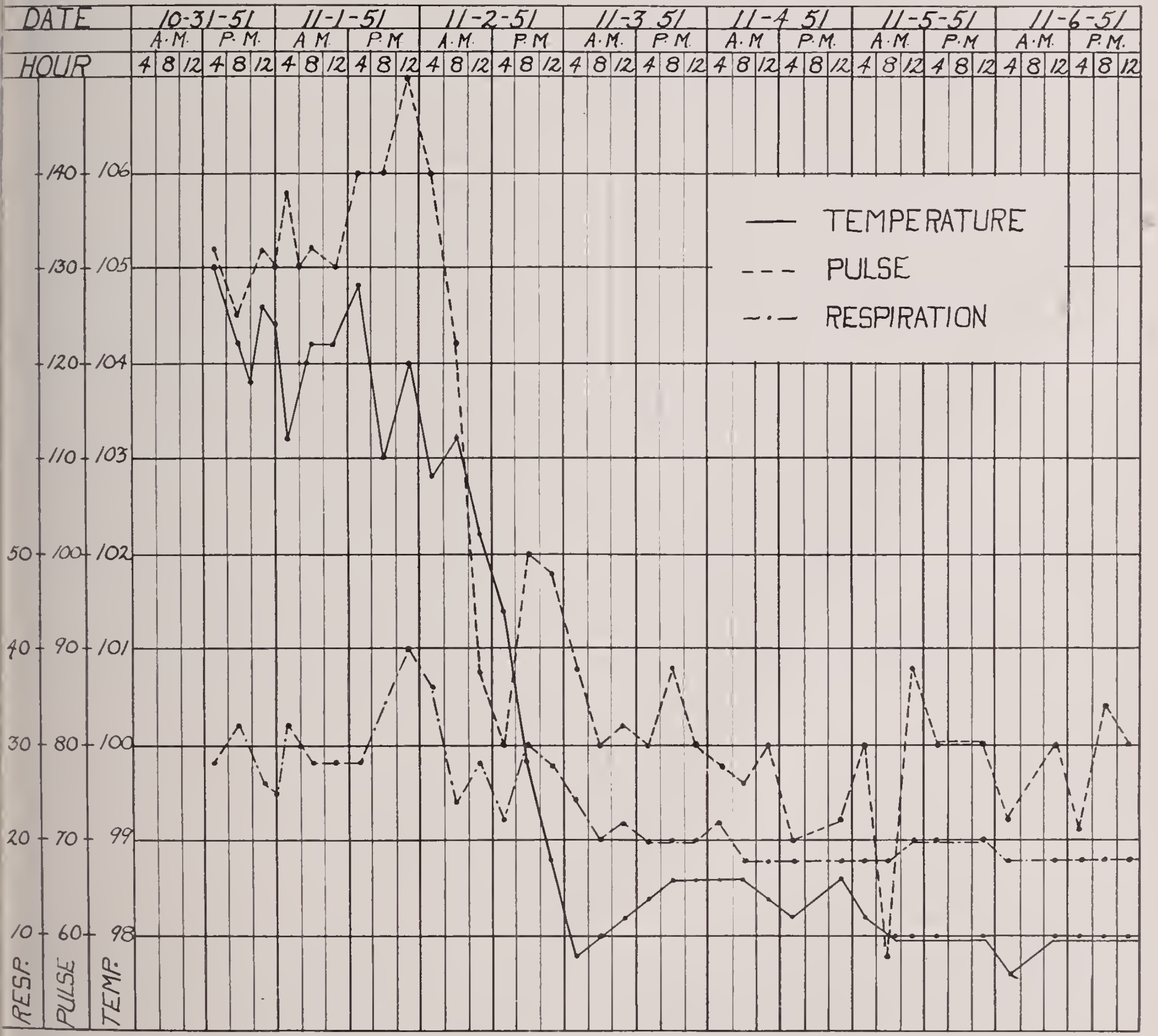


Fig. 1.

On November 8, 1951, sternal marrow and peripheral blood were examined by Dr. S. T. Nerenberg, who gave the following report:

"*Peripheral Blood.*—Examination of the red blood cells shows moderate anisocytosis with minimal poikilocytosis. Polychromasia is also minimal. The platelets are normal in number and appearance. Examination of the white blood cells shows the following differential: neutrophils, 80 per cent; lymphocytes, 17 per cent; monocytes, 1 per cent; eosinophils, 1 per cent; normoblasts, 1 per cent. There is a very marked shift to the left in the neutrophil series. Some of these cells appear to be blast forms.

"*Bone Marrow Aspiration.*—Bone marrow hematocrit shows the following percentages: fat, 2 per cent; ME layer, 14 per cent; plasma, 45 per cent; red blood cell layer, 39 per cent; total, 100 per cent. Examination of the bone marrow smears shows a marked increase in number of developing neutrophils. There is not an increase in the number of myeloblasts. The cells in the red blood cell series are decreased because of the marked increase in the neutrophilic series. Megakaryocytes are normal in number as are their developing platelets. Examination of the paraffin sections of the bone marrow shows a moderate hyperplasia of the marrow elements. A moderate amount of fat is still present.

"*Comment.*—The first peripheral smear seen on this patient was highly suggestive of myelogenous leukemia. However, subsequent smears and the bone marrow aspiration fairly definitely rule out leukemia.

"*Diagnosis.*—(1) Leukemoid reaction. (2) Neutrophilic leukocytosis. (3) Hyperplastic bone marrow."

On November 16, 1951, the patient was discharged with a normal blood picture and no acute symptoms.

Summary

A case of agranulocytosis is reported in which treatment of a moribund patient with ACTH and cortisone combined with penicillin and streptomycin was dramatically successful. A marked leukemoid reaction in the bone marrow was noted which abated with cessation of steroid therapy. The immediate response in this patient, confirming other reports in the literature since and before this patient was treated, would indicate that corticotropin and/or cortisone with antibiotics should be the treatment of choice in severe agranulocytosis.[11,15]

References

1. Blumenthal, J. S.: ACTH and cortisone in allergy Journal-Lancet, 73:455 (Nov.) 1953.
2. Blumenthal, J. S.: Cortisone in allergy. Journal Lancet, 69:473, 1951.
3. Croke, A. R., and Berry, J. W.: Agranulocytosis occurring during methimazole ("tapazole") therapy J.A.M.A., 148:45 (Jan.) 1952.
4. Dameshek, W.: Agranulocytosis. Oxford Medicine Vol. 2. New York: Oxford Press, 1949.
5. Etess, A. David, and Jacobson, Abraham S. Fatality due to agranulocytosis following use of phenylbutazone (butazolidin). J.A.M.A., (March 1953.
6. Hagerman, Dwain D., and Franzblau, Sanford A. Gantrisin (sulfisoxazole)—induced granulocytopenia J.A.M.A., (Dec.) 1951.
7. Hart, F. D.; Wraith, D. G., and Mansell, E. J. B. Agranulocytosis successfully treated with corticotropin. Brit. M. J., (June) 1952.
8. Hinz, Carl; Lamont-Havers, Ronald W.; Cominsky Burton, and Gaines, Leonard, M.: Agranulocytosis following use of phenylbutazone (butazolidin) J.A.M.A., (Jan.) 1953.
9. Hussar, Allen E., and Rogers, Helen B.: Agranulocytosis occurring during phetenylate ("thiantoin" sodium therapy. J.A.M.A., (Aug.) 1952.
10. Kracke, R. R., and Garver, H. E.: Diseases of the Blood and Atlas of Hematology With Clinical and Hematologic Descriptions of the Blood Diseases Including a Section on Technique and Terminology Chap. 12. Philadelphia: J. B. Lippincott Co., 1937
11. McCluskey, Harry B.: Corticotropin (ACTH) in treatment of agranulocytosis following sulfisoxazole therapy. J.A.M.A., (May) 1953.
12. McMillin, J. S.: Successful use of ACTH in treatment of agranulocytosis due to sulfadiazine. Am J. M. Sc., (Oct.) 1951.
13. Silverman, Jacob J., and Worthen, Joseph F.: Agranulocytosis in a patient treated with mercurial diuretics. J.A.M.A., (Jan.) 1952.
14. Stifel, John L., and Burnheimer, J. C.: Agranulocytosis following administration of phenylbutazone (butazolidin) J.A.M.A., (Feb.) 1953.
15. Virkkunen, M.: Corticotropin and cortisone in treatment of agranulocytosis and thrombocytopenic purpura. A.M.A. Arch. Int. Med., (Nov.) 1952.

METASTATIC NEOPLASMS

(Continued from Page 446)

22. Richter, H.: Bronchialkarzinom mit metastasen in einer zehe und im penis. Zbl. allg. Path. Anat., 90:24, 1953.
23. Thompson, H. T.: Involvement of the penis by carcinoma of the rectum. Surgery, 27:216, 1950.
24. Waller, J. I., and Hellwig, C. A.: Metastases to the corpora cavernosa from carcinoma of the prostate. J. Urol., 69:157, 1953.
25. Wattenberg, C. A.: Unusual tumors and secondary carcinomas of the penis. Review of the literature and report of a case. J. Urol., 52:169, 1944.
26. Weber, quoted by Scheuer, O.: Uber priapismus Arch. f. Derm. u Syph., 109:458, 1911.
27. Wilson, M. C.; Horton, G. R., and Horton, B. F Secondary tumors of the penis. J. Urol., 71:721 1954.

Minnesota Automotive Crash Injury Research Program

A. B. ROSENFIELD, M.D.
Minneapolis, Minnesota

IN a further effort to decrease injuries and deaths on the highways of Minnesota, the Minnesota State Medical Association, the Minnesota Hospital Association, the Minnesota State Highway Patrol and the Minnesota Department of Health have undertaken a joint research program in collaboration with Cornell University Medical College. This study will begin about August 1, 1956, and will continue for two years. It will have as its primary purpose the gathering of factual information on the specific causes of injury to the occupants of passenger automobiles involved in accidents occurring on the rural highways of Minnesota. The Automotive Crash Injury Research project at Cornell University Medical College will integrate the Minnesota study into its interstate plan which is composed of the following other states engaged in similar research: Virginia, Maryland, North Carolina, Connecticut, Indiana, Arizona, Vermont, Texas, California, and the City of Minneapolis as an urban study.

The Cornell Automotive Crash Injury Research has been in progress since 1951 and is an outgrowth of similar Cornell studies in the aircraft field. It is sponsored by the Armed Forces Epidemiological Board under the Commission on Accidental Trauma, and the United States Public Health Service, with additional funds recently provided by the Ford Motor Company and the Chrysler Corporation.

The findings produced by this interstate project to date have identified the most frequent causes of injury in passenger automobile accidents as: ejection from doors which open as a result of impact on some section of the car other than the door itself; contact with the instrument panel; contact with windshield and header strip; contact with steering wheel and steering components; and contact against door structures. The information produced is used by automobile manufacturers as a basis for planning design changes in automobile structures aimed at reducing the frequency and severity of injuries in accidents.

The results can already be seen in many new automobile models now on the highways. Structural changes and new equipment include a new type door latch designed to keep doors closed under crash conditions, a steering wheel designed to absorb impact injury and to reduce injury to the chest, and optional installation of padding with a high energy absorbing characteristic and seat belts. These design improvements have been made possible only through the complete and thorough medical data contributed by physicians. The specific information on the nature, location and extent of injuries to automobile accident victims recorded by physicians is being correlated with information on the exact causes of injury submitted by state police and highway patrolmen investigating the accidents. Special photographs showing car damage, both inside and out, and all pertinent accident details are also submitted by the investigating officer.

Now that certain manufacturers are introducing design changes based on findings from the highways of the states participating in the study, Dr. John O. Moore, Director of the Cornell Automotive Crash Injury Research, points out that a new pressing problem has been created by the need to evaluate the precise degree of improvement which these engineering changes have had in controlling injuries when the new automobiles are involved in accidents.

The special medical form to be filled out by physicians is brief and the number of cases handled by each physician will be low. First of all, while the period of study will be two years it is subdivided into periods of six months each in selected sample areas. The study is limited to accidents investigated only by state highway patrolmen on rural highways in certain designated areas and for limited periods of time. No urban areas are included. Furthermore, the study is limited to

---

Dr. Rosenfield is Medical Co-ordinator for this Research Program, Minnesota Department of Health, University Campus, Minneapolis.

passenger cars and is not concerned with occupants of buses, motorcycles or pedestrians.

Complete details of all injuries, no matter how minimal, with their degree and location are most important. This, however, will not be a formidable task since 75 per cent of persons injured in automobile accidents suffer only minor injuries. The request for the medical report will be made by the Minnesota Department of Health, usually through the state highway patrolman, and a special medical form will be supplied. No forms should otherwise be filled out. The completed medical form should be mailed promptly to the Minnesota Department of Health, University Campus, Minneapolis 14, who will be responsible for collecting the accident forms, photographs, and the medical forms.

The data submitted by physicians are for research purposes only. Under the laws of Minnesota such data, as well as data collected in the Minnesota Maternal Mortality Study, the Hennepin County Perinatal Mortality Study and other studies carried out by the Minnesota Department of Health in co-operation with other organizations and agencies, are confidential and can onl be used for research purposes. Furthermore, th names of the physician and patient are recorded o a perforated section of the medical report whic is removed and destroyed as soon as injury an accident facts are recorded on I B M punch card.

Automobile manufacturers have already foun the data of value in the improvement of safet features in automobile design. Insurance, th military, public health, safety and enforcemen groups will also find the data useful in enforcement and educational efforts. In addition, thes data are producing statistics which promise to b of value to physicians treating auto crash victim and the Traumatic Committee of the America College of Surgeons has expressed great interest i the study.

Prompt submission of reports on all automobil accident-injury patients will play an importan part in the prevention of deaths or injuries resul ing from auto accidents in the future.

HARMFUL EFFECTS OF INTERPRETIVE PSYCHOTHERAPY

(Continued from Page 453)

place, there frequently is alleviation of his guilt and also an improvement in his sexual behavior. However, when there is objective clinical evidence of beginning deterioration, interpretive psychotherapy is to no avail. Moreover, when there is deterioration, the prognosis for improvement in the individual's sexual behavior is and must remain doubtful. We usually advise that these patients be kept under fairly close observation and that they never be permitted to be with younger people unless accompanied by some responsible person.

Conclusion

There are two types of psychotherapy: expressive or deep; and repressive or supportive.

2. Whether the involutional depressions are exogenous or endogenous is debatable. However, there probably is no such thing as a purely endogenous or purely exogenous depression.

3. In certain of the involutional depressions expressive therapy with interpretation is hazardous and at times even harmful.

4. In certain of the involutional depression suppressive therapy and management at the leve of reassurance, together with careful attention t the patient's social adjustment, suffice.

5. The idea that unless the person with a depression is treated analytically, the illness wil recur is erroneous.

References

1. Bromberg, Walter: Man Above Humanity. Pag 274. Philadelphia: Lippincott, 1954.
2. Kallmann, Franz: Genetic principles in manic depressive psychosis. In: Depression. Edited b Paul Hoch and Jos. Zubin. Pages 19-20. Nev York: Grune & Stratton, 1954.
3. Reiss, Max: Investigation of hormone equilibriu during depression. In: Depression. Edited by Pau Hoch and Jos. Zubin. Page 69. New York: Grun & Stratton, 1954.
4. Fabing, Howard D.: The dimensions of neurolog Neurology, 5:604 (Sept.) 1955.
5. Kamman, Gordon R., and Kram, Charles: Valu of psychometrics in medical diagnosis and treatment. J.A.M.A., 158:558 (June 18) 1955.
6. Diethelm, Oskar: Treatment in Psychiatry. Pag 182. New York: Macmillan Company, 1936.
7. Freud, S.: The Ego and the Id. London: Hogarth, 1927.

1044 Lowry Medical Arts Building

Iedicatio Inhalatiorum

MAURICE S. SEGAL, M.D.
Boston, Massachusetts

NHALATION therapy has attained amazing prominence since the ancient and empirical ractice of inhaling medicated vapors. The re- arkable anatomical structure of the lungs, with s tremendous inner surface area and unique low ressure, low resistance and remarkable distensible rculatory apparatus, has made it possible to chieve high therapeutic levels at parenchymal tes with the use of therapeutic agents admin- tered by the inhalatory and parenteral routes, lone or combined. To a growing list of directive rms must be added the "pulmonary route."

Inhalation therapy in its skilled practice covers wide spectrum of physiologic and pharmacologic nowledge. The broad concept of the alveolar-apillary membrane includes all of the anatomic nd physiologic road blocks in normals from the tmosphere to the tissue cells. The anatomic struc- ures, to mention some, include the tracheobron- hial tree, alveolar membranes, elastic and con- ective tissue fibrils, lymph channels and contents, apillary membrane and contents including the red lood cell envelope and hemoglobin, blood plasma nd contents and ultimately the tissue spaces and heir contents. In the sick patient further road locks appear in the form of inflammatory prod- cts—cells, detris, fibrin, collagen, et cetera. The hysiologic processes of ventilation, distribution, liffusion and perfusion influence and are influ- nced by the "alveolar-capillary membrane." In- leed, oxygen and carbon dioxide have a rough oad, readily beset by many obstacles to interfere vith the process of external and internal respira- ion.

There has been tremendous interest in the use of (1) therapeutic aerosols, (2) the hazards of oxygen therapy, and (3) pressure breathing ther- apy. Several of these advances will be discussed.

Therapeutic Aerosols

The clinical acceptance of the value of properly administered bronchodilator aerosols for the relief of bronchospasm has become widespread. We recently demonstrated in the laboratory considerable improvement in mechanical resistance, pressure-volume relationships, lung compliance and the actual work of breathing after the inhalation of bronchodilator aerosols. Many investigators have stressed the importance of obtaining high pulmonary parenchymal levels with aerosols of penicillin and streptomycin in resistive bronchopulmonary infections and in brochiectatic and atelectatic areas of lung. Others have stressed the useful antiphlogistic action of the corticosteroid aerosols in patients with allergic and inflammatory lesion in the upper respiratory passages; the value of detergent aerosols, enzyme aerosols and alcohol vapors as bronchial cathartics, muco-lytic and pus-lytic and anti-foaming agents respectively, and finally the appreciation of the greater usefulness of cold water vapor aerosols with continuous nebulization techniques (in the croupy disorders) as compared to the ancient steam kettle and the assortment of messy croup tents formerly employed.

Hazards of Oxygen Therapy

The emergence of oxygen as a double edged sword, although fully appreciated by many, has unfortunately been slow in universal recognition. Oxygen should be regarded as a drug with strict limitations and definite dosages (concentrations) —both useful and devastating. The physician must learn to prescribe the exact concentration needed, the duration of therapy and the specific type of apparatus best suited for the patient and his illness.[1,2] The tremendous increase in the incidence of retrolental fibroplasia has been attributed to the increased and casual use of high concentrations of oxygen without regard for duration of therapy and the need for gradual reduction in concentrations in the premature infant. It has also been attributed to the use of respiratory depressing drugs and hypoxia-inducing anesthesia in the mother during delivery. It would appear that any form of therapy which permits relative hypoxia by abrupt changes from high to low oxygen tensions in the premature infant may cause retrolental fibroplasia. Oxygen should be reserved for the premature infant with manifestations of asphyxia and then should be administered in concentrations

---

Dr. Segal is Director, Lung Station (Tufts) and Department of Inhalation Therapy, Boston City Hospital; Clinical Professor of Medicine, Tufts College Medical School.

not exceeding 40 per cent properly humidified and for as short a time as possible. One should always be certain of a clear tracheo-bronchial pathway.

The danger of respiratory acidosis is always present in patients with chronic hypoxia, secondary to chronic pulmonary emphysema or cardiopulmonary heart disease. This may occur spontaneously in the course of the disease or be induced by an infection of the respiratory tract or by the inadvertent administration (paradoxical therapeutics) of *high* concentrations of oxygen along with respiratory depressing drugs. The basic defective mechanism which is responsible for the progression of this syndrome is inadequate alveolar ventilation with marked retention of carbon dioxide. The carbon dioxide retention usually brings about a compensatory increase in the alkali reserve (metabolic alkalosis) and a fall in serum chlorides and increase in urine chlorides.[3] Failure in compensatory rise in buffer base and an ultimate drop in arterial pH may develop rapidly, leading to a fatal issue.

If respiratory acidosis develops during the inadvertent administration of high concentrations of oxygen, the method should be changed to the nasal catheter technique, employing oxygen flows of 1 liter per minute, with gradual daily increases.[1,2] If an opiate or demerol has been the cause of respiratory depression, it should be countereacted at once by the administration of Nalline.[1]

Pressure Breathing Therapy

A very interesting chapter in mechanical respiration has been the recent advances in pressure breathing therapy.[4,6,7,8] Many investigators have observed the value of intermittent positive pressure breathing during inspiration with the simultaneous administration of bronchodilator aerosols, noting relief of bronchospasm, improvement in ventilation and distribution factors, and elimination of carbon dioxide. In the laboratory we have observed a decrease in mechanical resistance, improvement in lung compliance and also a progressive rise in venous pressure after fifteen minutes of this form of therapy.[5,6] Because of inadequate circulatory dynamics in patients under circulatory stress this form of pressure breathing should not be employed in patients who are on the verge of or in peripheral vascular collapse, heart failure or those having spinal anesthesia. The venous-gradient return to the right side of the heart may become more inadequate and a further drop in cardiac output may ensue.[7]

More recently another form of pressure breat ing has been described, wherein alternating p itive and negative pressures are applied to t oro-pharynx.[6,8] Following the positive pressure du ing inspiration, a very rapid changeover to hi negative pressures during expiration is achiev ("exsufflation with negative pressure").[8] This associated with high peak flow rates during ex ration approaching those noted in a success cough. It has been shown that with positive a negative pressures the mean mask pressure a proaches more closely that of ambient air[6] and furthermore safer in reconstituting the veno gradient return to the right side of the heart.[7]

In the laboratory we have noted in patie with chronic pulmonary emphysema actual bro chial chattering in our tidal volume curves a pneumotachograph tracings during the high piratory flow rates.[5,6] This is a form of ball val ing described by others in these patients dur coughing and vigorous expiration. In patients w chronic pulmonary emphysema the critical locity rate may be below 500 cc./second. Abo this rate laminar flow is converted to turbule flow. Added pressures will probably not impro flow rates under such circumstances in patie with chronic pulmonary emphysema.[9] This fo of therapy has been found most useful, howev and even life saving in patients with ineffecti cough mechanisms and trapped secretions seco ary to bulbar poliomylitis, atelectasis, bronchie tasis, lung abscess and inhalation poisonings.[6,8]

References

1. Segal, M. S. and Dulfano, M. J.: Chronic P monary Emphysema. Physiopathology and Tre ment. New York: Grune & Stratton, Inc., 1953.
2. Barach, A. L.: Physiologic Therapy in Respirat Diseases. Second edition. Philadelphia: J. B. L pincott Co., 1948.
3. Barach, A. L., and Richards, D. W., Jr.: Effe of treatment with oxygen on cardiac failure. Ar Int. Med., 48:325, 1931.
4. Cournand, A; Motley, H. L.; Werko, L., a Richards, D. W., Jr.: Physiological studies of t effects of intermittent positive pressure breath on cardiac output in man. Am. J. Physiol., 15 163, 1948.
5. Attinger, E. O., and Segal, M. S.: (In press).
6. Segal, M. S. and Attinger, E. O.: Advances inhalational therapy in the management of disea of the chest. Am. J. Surgery, 89:387, 1955.
7. Maloney, J. V., and Handford, S. W.: Circulat responses to intermittent positive pressure breath and alternating positive-negative pressure breathi J. Applied Physiol., 6:453, 1954.
8. Barach, A. L., and Beck, G. J.: Exsufflation w negative pressure. Arch. Int. Med., 93:825, 19
9. Fry, D. L.; Ebert, R. V.; Stead, W. W., a Brown, C. C.: The mechanics of pulmonary v tilation in normal subjects and in patients w emphysema. Am. J. Med., 16:80, 1954.

Now Available

7 Years Sickness Benefits

(HOUSE CONFINEMENT NOT REQUIRED)

Lifetime Accident Benefits

This extension of benefits is now available to you as a member of the Minnesota State Medical Association. Since December, *1947,* the inception date of our plan for members of your Association, the Caswell-Ross Agency has attempted at all times to secure for you the finest coverage in the accident and sickness field. These improvements will make your policy the best among many available to you. An application has been sent to you previously—why not complete and return it to our office now.

CASWELL-ROSS AGENCY

1177 N. W. Bank Building Minneapolis 2, Minnesota
Minneapolis—FE 2-2585 St. Paul—MI. 5-7004

Administrators of Professional Disability Plans

Minnesota State Bar Association
Minnesota State Dental Association
Minnesota Society of C. P. A.
Minnesota State Pharmaceutical Assn.
Minnesota Auto Dealers Association
Minnesota Federation of Eng. Societies
Minnesota State Veterinary Medical Soc.
Hennepin County Medical Society
Hennepin County Bar Association
11th Judicial Bar Association
Minneapolis Association of Life Underwriters
Minnesota State Life Underwriters Assn., Inc.

Ramsey County Medical Society
Ramsey County Bar Association
St. Paul District Dental Soc.
Minneapolis District Dental Soc.
St. Cloud Dental and Stearns County Medical Society
Duluth District Dental Society
East Central Medical Society
St. Louis County Medical Society
West Central Dist. Dental Society
Northwest Proprietors Association
St. Paul Life Underwriters, Inc.

ACHROMYCIN

Tetracycline *Lederle*

in the treatment of

infections in surgery

The prevention and control of cellulitis, abscess formation, and generalized sepsis has become commonplace technique in surgery since ACHROMYCIN has been available. Leading investigators have documented such findings in the literature.

For example, Albertson and Trout[1] have reported successful results with tetracycline (ACHROMYCIN) in diverticulitis, gangrene of the gall bladder, tubo-ovarian abscess, and retropharyngeal abscess. Prigot and his associates[2] used tetracycline in successfully treating patients with subcutaneous abscesses, cellulitis, carbuncles, infected lacerations, and other conditions.

As a prophylactic and as a therapeutic, ACHROMYCIN has shown its great worth to surgeons, as well as to internists, obstetricians, and physicians in every branch of medicine. This modern antibiotic offers rapid diffusion and penetration, quick development of effective blood levels, prompt control over a wide range of organisms, minimal side effects. There are 21 dosage forms to suit every need, every patient, including

ACHROMYCIN SF

ACHROMYCIN with STRESS FORMULA VITAMINS. Broad-range antibiotic action to fight infection; important vitamins to help speed normal recovery. In *dry-filled, sealed* capsules for rapid and complete absorption, elimination of aftertaste.

dry- filled sealed capsules

---

[1] Albertson, H.A. and Trout, H. H., Jr.: *Antibiotics Annual* 1954-55, Medical Encyclopedia, Inc., New York, N.Y., 1955, pp. 599-602.

[2] Prigot, A.; Whitaker, J. C.; Shidlovsky, B. A., and Marmell, M.: *ibid*, pp. 603-607.

Lederle

LEDERLE LABORATORIES DIVISION
AMERICAN CYANAMID COMPANY
PEARL RIVER, NEW YORK

®REG. U.S. PAT. OFF

PHOTO DATA: AERIAL CAMERA WITH K-2 FILTER
AT DUSK, F.11, 4/100 SEC., FAST PAN FILM

ACHROMYCIN ACHROMYCIN [redacted]

Only Meat

. . . is Meat

Suppose we suddenly found ourselves in a "Brave New World," in which all the rich protein, the B vitamins (including the important B_{12}), the minerals, and all the other nutrients of a juicy steak or a succulent pork chop could be compressed into a capsule. Suppose we were to take one or two such capsules each day. What would happen?

Would we be just as healthy? Would we be as happy?

There is something about man's wish for meat that cannot be satisfied by chemical or mathematical analyses. The feeling of satisfaction, the downright enjoyment of biting into and chewing, the pleasurable effect of having eaten well . . . all these make meat more than just an impressive list of essential nutrients. Long before man knew anything about the science of nutrition he knew meat was part and parcel of his health and his joy of eating and of living.

Other foods may be fortified and enriched, *but none can ever take the place of meat.*

Only meat is meat.

The nutritional statements made in this advertisement have been reviewed by the Council on Foods and Nutrition of the American Medical Association and found consistent with current authoritative medical opinion.

American Meat Institute
Main Office, Chicago . . . Members Throughout the United States

ongenital Hemihypertrophy and emihypoplasia

DORRANCE BOWERS, M.D.
Rochester, Minnesota

ONGENITAL hemihypertrophy and hemihypoplasia are anomalies that provide grotesque ricatures of the minor asymmetries present in ery human body. The purpose of this commucation is to present photographs of patients with ach of these rare anomalies.* These photographs all attention to the cosmetic and tailoring probems and the difficulties with gait and posture that uch patients face. Physicians may fail to realize he distress that malocclusion of the teeth[1] may ause these unfortunate victims of nature's caprice.

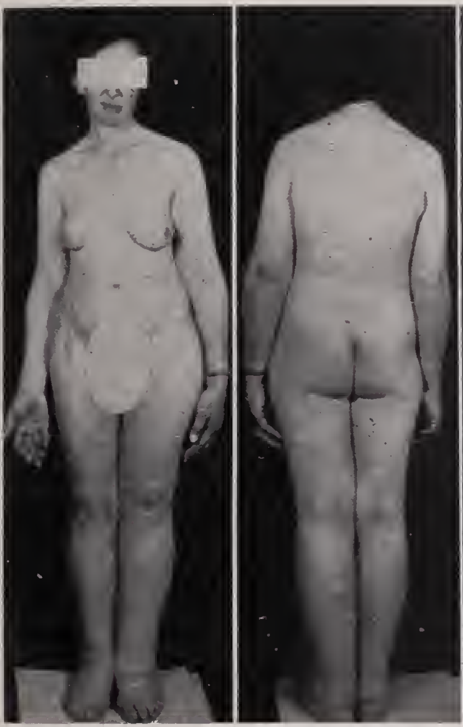


Fig. 1. Congenital left hemihypertrophy. Note the asymmetry of the mouth, trunk and extremities. The right tibia was 37.5 cm. in length, whereas the left was 40 cm., as measured from roentgenograms. A hemangioma at the left angle of the mouth and another on the left forearm are not well shown.

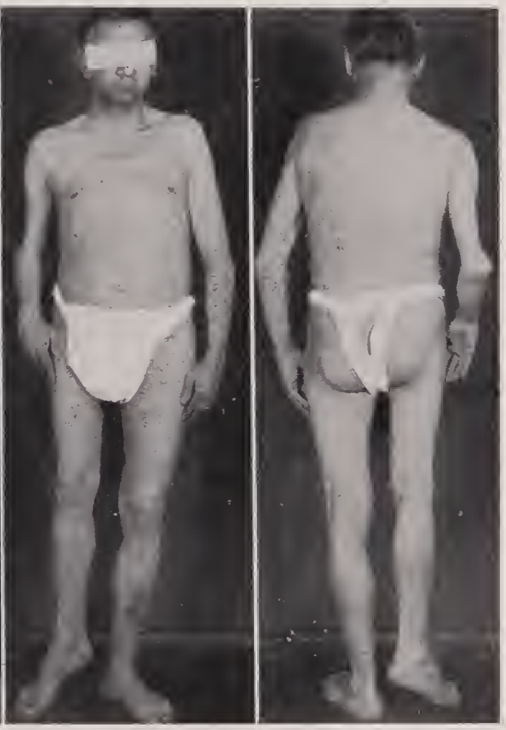


Fig. 2. Congenital right hemihypoplasia. Again, note the asymmetry of the mouth, trunk and extremities. An associated congenital anomaly of the right elbow also is shown.

The right half of the body of each of these two patients has been smaller than the left since birth (presumably also since before birth). The left half of the body may have become larger than the right because of excessive development of the left side, referred to as hemihypertrophy (Fig. 1). The discrepancy also may arise because of incomplete development of the right side; this particular condition has been referred to as hemiatrophy but it is designated more correctly as hemihypoplasia (Fig. 2).

The physician may recognize readily distortion resulting from the unequal size of the two halves of the body in patients who have such anomalies. However, he may be unable to specify which is

(Continued on Page 466)

---

*The author is indebted to Dr. L. E. Ranta, Assistant Director-Medical, Vancouver General Hospital, Vancouver, British Columbia, for permission to publish these photographs.

Case Presentations

Bronchogenic Carcinoma with Unusual Presenting Symptoms

RICHARD F. KLINE, M.
Minneapolis, Minnesc

THIS is the history of a man with bronchogenic carcinoma, who, in addition to the symptoms associated with a pulmonary neoplasm, complained of pain in the hip; who, following examination, was found to have clubbing of the fingers and auricular fibrillation.

This fifty-six-year-old white man was admitted to the Abbott Hospital, Minneapolis, Minnesota, on October 30, 1953. During the preceding two weeks he had had a productive cough, shortness of breath, loss of appetite, and recurrent febrile episodes. He had lost 10 pounds in weight. Several weeks earlier he had noticed some enlargement of his finger tips, and more recently he had had a persistent, aching pain in the right hip. He felt that he had not actually "been well since July or August." He smoked one to two packages of cigarettes daily.

The pertinent physical findings revealed a well-developed, white man with a blood pressure of 130/90. The radial pulse was irregular and difficult to obtain. The apical pulse rate was approximately 140. Thyroid, breast, and lymphatics were normal. The lungs were clear. The heart was moderately enlarged to percussion. There was a discrete area of tenderness over the crest of the right ilium. Examination of the genitalia, rectum, and prostate failed to reveal any abnormalities. There was moderate clubbing of the fingers.

The initial chest x-ray was reported as showing a slight thickening of the pleura at the base of the left lung with a rounded nodule in the base of the right lung (Fig. 1). This *probably* represents a childhood tuberculosis, the report stated, but a repeat x-ray film in six months should be taken to establish this diagnosis. Stereoscopic antero-posterior pelvic x-rays showed hypertrophic changes of the lower lumbar vertebrae. The hemoglobin was 14.1 grams; red blood cells 4.7 million; white blood cells, 13,800 with 75 per cent polymorphonuclear cells and 25 per cent lymphocytes; the sedimentation velocity was 37 mm. in one hour, and the serology was negative. The urinalysis and concentration tests were normal. The liver function tests were normal with the exception of a 15 per cent bromsulfophthalein retention at forty-five minutes.

Treatment consisted of an attempt to digitalize patient. Following consultation the digitalis was stop and quinidine was used. This produced a nor rhythm. His oral sepsis and pulmonary disease treated with penicillin. He was discharged Novembe , 1953, with relief of his pulmonary symptoms. The n over the ilium persisted without explanation.

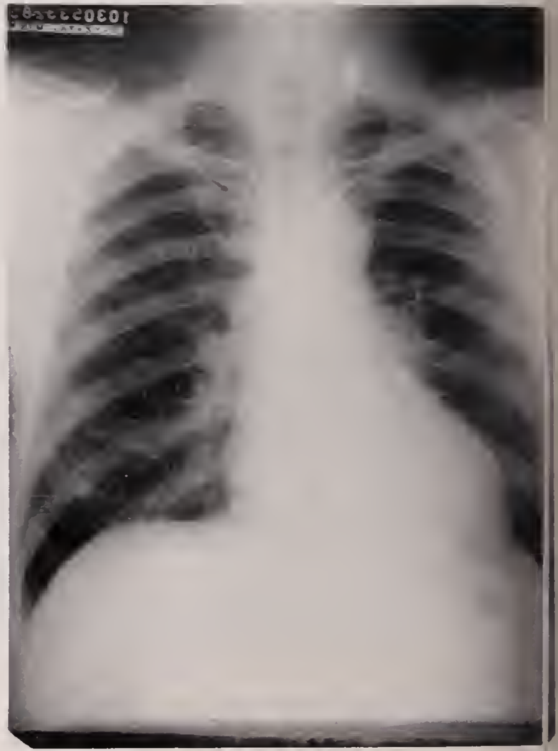


Fig. 1. Chest x-ray, October 30. 1953. In retrosp , the lesion appearing at the base of the right lung r have been neoplastic in origin.

The auricular fibrillation recurred despite the qu dine. He was readmitted to Abbott Hospital on cember 1, 1953. There had been little increase in s pulmonary symptoms; however, the clubbing of e fingers had increased and the pain in the hip as worse. Digitalis finally controlled the tachycar . X-rays of the pelvis were again normal. Labora y studies were normal except for the sedimentation locity, which had increased to 76 mm. in one h r

---

From the files of Drs. W. W. Rieke and R. F. Kline, Wayzata, Minnesota.

Dr. Kline is now associated with the Veterans Administration Hospital, Minneapolis.

T basal metabolic rate was normal. The patient soon de loped a cough which was productive of small a unts of bloody sputum. Rhonchi were heard poste orly in the left base. Sputum studies were negative f acidfast bacilli and tumor cells. A chest x-ray rep ted pleural thickening at the left costophrenic angle. B nchoscopic examination was deferred because of the c diac condition. Twelve days after this second admiss n a mass appeared over the crest of the right ilium. biopsy specimen of this mass revealed a highly anap stic metastatic adenocarcinoma (Figs. 2 and 3). Furt r x-rays and laboratory studies failed to reveal the p nary lesion. It was presumed that the primary lesion w either in the lungs or the pancreas. The patient r urned home on December 19, 1953.

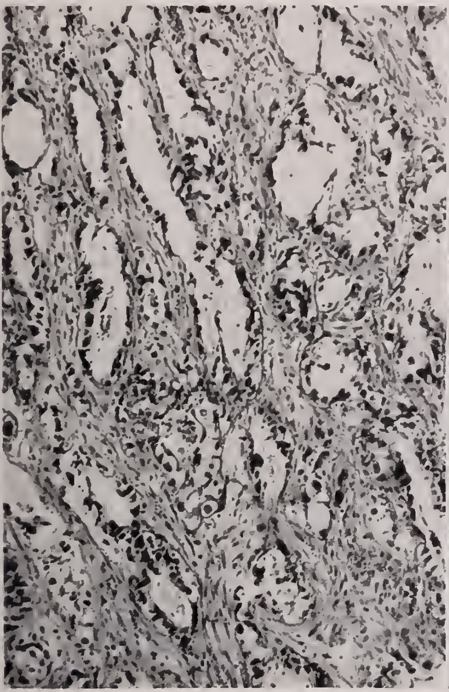


Fig. 2. Photomicrographs of biopsy from soft tissue along iliac crest. ×100.

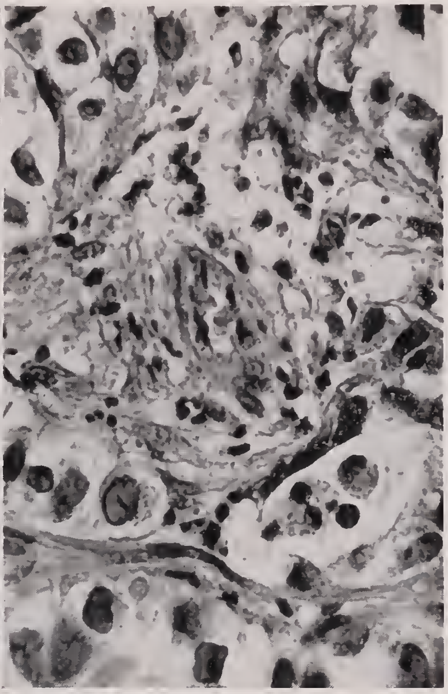


Fig. 3. Photomicrographs of biopsy from soft tissue along iliac crest. ×440.

He was admitted to Northwestern Hospital on Dec ber 31, 1953, for palliative x-ray therapy to the reg n of the right hip. While hospitalized, he developed an a lectasis of the left lower lobe of the lung, and he had p n and tenderness over the left fifth rib anteriorly. X ay examination now revealed a mass in the left lower h m (Fig. 4). He received palliative x-ray therapy to t lungs and mediastinum. There was further weight l with increasing difficulty in controlling the heart r with digitalis.

The patient was discharged from the hospital on Jan y 22, 1954, and he died at his home on February 10, 1 4.

Summary of Autopsy Findings

An ulcerating tumor measuring approximately 7 by 5 5 cm. was found along the right main bronchus about 1 cm. from the carina. The tumor extended into the mediastinum and into the left atrium of the heart at the point of entry of the superior pulmonary vein. A tumor nodule, presumably metastatic, 4 cm. in diameter, was found in the *right* lower lobe. The left pleural cavity was bound down by firm, fibrous adhesions.

Metastases (in addition to the one examined along the right iliac crest) were found in the liver, spleen, kidneys, ilium, and the adrenals, with the latter organs almost entirely replaced with tumor tissue.

"Sections of the primary tumor and the metastases showed it to be composed of aberrantly growing and infiltrating gland structures. In places the epithelium is in the form of tall columnar epithelium, with evidence of mucin secretion. In other areas the tumor is undifferentiated, markedly pleomorphic, and shows numerous mitotic figures."

Discussion

The presenting symptomatology of bronchogenic carcinoma, as illustrated in the above case, is often varied and baffling. This disease is notorious for first presenting symptoms and findings suggestive of a bronchopneumonia, responding temporarily to antibiotics. In addition to the usually described symptoms of cough, hemoptysis, chest discomfort, dyspnea, et cetera, one may be confronted with secondary phenomena which may or may not be metastatic. Central nervous system metastases are common for bronchogenic carcinoma is second only to primary brain tumors in central nervous system malignancies. The very nature and location of this tumor readily permits widespread dissemination of metastases. The chest x-ray may possibly reveal nothing or leave one with rather inconclusive findings. A knowledge of these secondary symptoms and findings will raise the physicians's index of suspicion and lead to early chest x-rays; and, even where these are negative, to cytologic, bronchoscopic, bronchographic, and planigraphic studies.

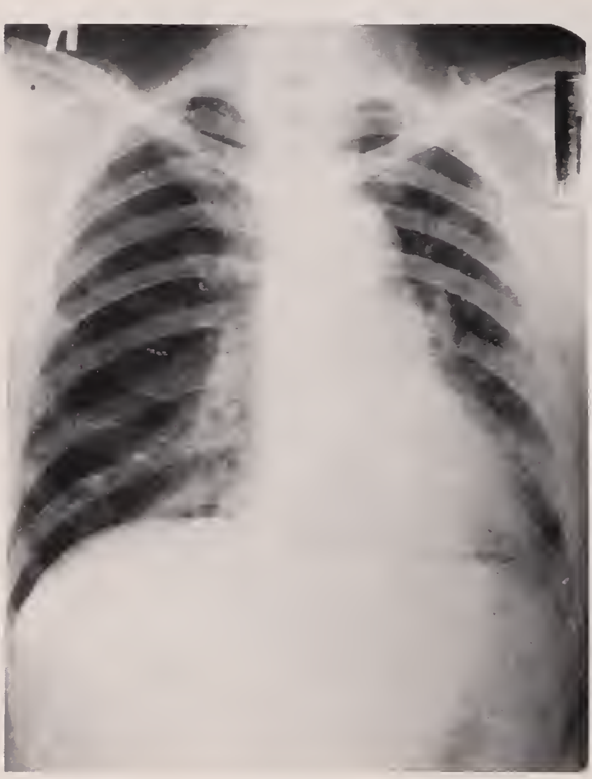


Fig. 4. Chest x-ray, January 6, 1954, first showing extensive changes in the left hilum.

The skin and soft tissue are unusual sites of dissemination of bronchogenic carcinoma. Entieknap, noting the location of metastasis, reported an incidence of 2 per cent to skin or soft tissue.[3] In the above patient the soft tissue tumor was interesting. By so closely mimicking a bone lesion, it proved to be an enigma to all who examined the patient. Ultimately, it definitely established the diagnosis of malignancy.

Cardiac neoplams, although uncommon, are not as uncommon as generally believed; and the majority are metastatic in nature.[1,2] The usual site of the primary tumor is either the bronchus or the breast, with the former site predomina
Entieknap, in his series of 1,000 cases of ca
with reference to metastases, reported forty
metastases to the myocardium or pericar
thirty-five of which had a primary site in
bronchus.[3] Ritchie reported a lesser, but
ratio implicating bronchial neoplasms in ca
metastases.[4] Knowledge of a metastasis to
heart is usually found only at autopsy—ph
findings or symptoms with reference to the
being very uncommon. The metastatic spre
the heart in the above case would readily ex
the refractoriness of the auricular fibrillation t
usual cardiac medications. White states
having excluded all other possibilities of ca
dysfunction, the rare possibility of a prima
secondary cardiac neoplasm should be
sidered.[5]

At present, the finding of distant metastas
most instances, may be of little more than
nostic help and may offer little definitive t
peutic benefit to the patient. Clubbing o
fingers alone or in association with long
proliferation and arthropathies is a physiolo
phenomenon which may occur early in the c
of the disease.[6,7,8] This phenomenon, know
pulmonary hypertrophic osteoarthropathy,
first described by Marie in 1890. It is char
ized pathologically by a general increas
fibroelastic and connective tissue in the enl
digits; the long bones show periosteal new
formation. By virtue of the large numb
theories offered to explain it, the etiology o
monary hypertrophic osteoarthropathy is o
scure.[9-12,14] Reported incidences vary from
10 per cent of all bronchogenic carcinomas.

One point should be emphasized: pulm
hypertrophic osteoarthropathy often occurs
—while the pulmonary lesion may still be
resectable stage. Pattison recently reporte
cases of bronchogenic carcinoma with pulm
osteoarthropathy, in five of which this wa
earliest significant finding.[16] It is apparent
that in some cases, we have available a diag
sign which may lead to the early diagnosi
bronchogenic carcinoma.

References

1. Robertson, C. K., and Russell, J. T. R.: Br
cancer as a cause of heart block. Edinburgh
57:257-260 (June) 1950.

(Continued on Page 474)

Traumatic Pancreatitis with Reference to the Abetting Influence of Pancreatic Stimuli

THOMAS O. MURPHY, M.D.,
and C. WALTON LILLEHEI M.D.

Minneapolis, Minnesota

HE occurrence of pancreatitis as a primary entity or as a complication is a serious one. e morbidty and the mortality of this condition ignificant, the treatment is not specific, and the uelae may be prolonged. Moreover, the diag- is may be difficult, and often is one of elimina- n. There is almost no other organ in the body t is able to disguise its disease so well.

The diagnosis of acute traumatic pancreatitis the absence of a penerating, or even a direct und to the abdomen, is even a more difficult iation. In such cases, there are often more vious injuries to call attention to other areas the body, and deep lying damage thus remains suspected. The following is such a case.

Case Report

Three days prior to his University Hospital admission, patient, a seventy-one-year-old white man, was the ver of one of the cars involved in a head-on auto- bile accident in which he suffered abrasions and lac- tions to the face, scalp, and contusions to the upper domen, and chest. Following emergency treatment he s discharged to his home the evening of the accident apparently good condition considering the magnitude the damage to his car.

The next day he developed shortness of breath, auric- r fibrillation and abdominal distention. He was hos- alized in his home area, and twenty-four hours later nsferred to the University Hospitals. Roentgenological amination of the chest showed left ventricular enlarge- nt and extensive pulmonary edema associated with ural effusion and areas of linear atelectasis. The ctrocardiogram showed left axis deviation, rapid ricular fibrillation with bursts of paroxysmal ventricu- tachycardia of short duration together with changes ggestive of ischemia. Abdominal x-rays disclosed a ture compatible with severe ileus.

The past history was not remarkable except for a otracted history of alcoholism. A blood alcohol drawn the time of the automobile accident revealed a level mpatible with an extreme degree of intoxication.

Physical examination upon hospital admission re- aled a well developed and well nourished seventy- e-year-old white man, in acute and severe respiratory distress associated with severe back and chest pain. The blood pressure was 130/70 mm. Hg, pulse rate was 144 per minute and his temperature was 102 degrees. The skin and nail beds were cyanotic. There were râles and ronchi in both lung fields. The heart was enlarged to the anterior axillary line, was grossly irregular, but with no murmur. The abdomen was very distended and without bowel sounds. There was direct tenderness in the epigastrium with mild rebound tenderness. The remainder of the physical examination was non-contributory.

Laboratory examination revealed a hemoglobin of 14.2 grams per 100 cc. of blood, white blood count was 6,300 with a normal differential count. Urinalysis showed a specific gravity of 1.018, albumen was 1 plus, and only occasional red and white blood cells were noted. Blood chemical examination revealed a BUN of 60 mg. per cent, creatinine of 1.8 per cent, carbon dioxide of 22 mEq./l., chloride of 112 mEq./l., sodium of 142 mEq./l., and potassium of 3.8 mEq/l.

The patient was obviously gravely ill and was thought to have traumatic myocarditis or infarct precipitated by the trauma of the steering wheel striking the chest superimposed upon arteriosclerotic heart disease. The etiology of the ileus was obscure but was considered to be on a reflex basis from the thoracic wall injuries. He was treated with rapid, digitalization and diuretics for the cardiac manifestations, and nasogastric suction to relieve his ileus. Intravenous fluids were necessary but the quantity was limited for the first twenty-four hours to prevent further pulmonary edema. Within twelve hours the heart rhythm had become regular and the pulmonary edema was relieved. The pulse rate continued between 100 and 140 per minute.

During the first four days in the hospital, the patient continued to be markedly confused and disoriented, with occasional episodes of gross tremor. This state was thought to represent a mild form of delerium tremens due to the history of chronic alcoholism.

Despite the prompt and dramatic improvement in this patient's cardiopulmonary status the severe ileus persisted out of all proportion to his other injuries. Exploratory laparotomy was considered at the time of admission, but was discouraged by his acute cardiac decompensation with pulmonary edema and the absence of any definite evidence of a perforated viscus. By the fourth day the reflex etiology for the persistent ileus seemed less tenable, and a serum amylase was drawn and found to be 386 units (normal 50 to 150 units). Continuous intestinal decompression and antibiotic therapy were continued and by the seventh hospital day (ten

---

From the Department of Surgery, University of Minne- ta Medical School, Minneapolis 14, Minnesota.

Dr. Murphy is a National Heart Trainee, U.S.P.H.S.

days after the accident) his ileus began to resolve. At this time the serum amylase had fallen to 143 units. He was discharged feeling well on the fourteenth hospital day.

Discussion

The problem of pancreatic injury was recognized as early as 1827 by Travers.[1] Naffziger and McCorkle[2] have emphasized the value of the serum amylase test in the recognition of acute traumatic pancreatitis. Interestingly, the experimental studies of Popper and Nechels[3,4] have shown that the resistance of the pancreas to injury by direct trauma is very great. In their animal studies, these authors were able to inflict considerable trauma to the pancreas and even open pancreatic ducts without finding fat necrosis or other evidence of pancreatitis when they sacrificed their animals. Significantly, they did not find this same to be true when only minimal trauma to the pancreas was inflicted after a pancreatic stimulus such as cholinergic drugs or food had been given. In such experiments even mild trauma resulted in a severe pancreatitis. From these studies, they have concluded that it is not the extensive pancreatic trauma that is of the greatest hazard, but rather trauma, even mild, associated with a pancreatic stimulus. Extensive pancreatic damage in the fasting state resulted in cessation of pancreatic secretion for a long enough period of time to allow the rents in the gland ductal system to be sealed by omentum or loops of bowel. However, with mild trauma combined with a pancreatic stimulus there resulted a flow of pancreatic secretions from the injured sites thus preventing sealing of the ductal system and with resultant pancreatic extravasation and fat necrosis. These experimental studies help explain the clinical observations of Warren,[5] who noted that the trauma to the abdomen in some patients with traumatic pancreatitis was trivial.

Likewise, this patient demonstrates the clinical application of this study. His accident occurr after an evening of dining and imbibing alcoholic beverages which "set the stage" for h accident as well as his pancreati was not diagnosed until his persistent ileus sev days following the accident caused a search f other etiologic factors and a serum amylase w drawn.

Summary

A case of traumatic pancreatitis following automobile accident associated with alcoholic i gestion is presented. The importance of food alcohol as pancreatic stimuli in abetting pa creatic susceptibility to trauma is described. T diagnosis of acute pancreatitis under these co ditions is easily overlooked if the possibility not kept in mind. The problem is further cor plicated, as the signs and symptoms of pancrea injury do not develop until some hours later, oft ten to thirty-six hours after the initial traum The trauma to the abdomen may often be co sidered trivial.

It is suggested that it should be a comm emergency room procedure to take this conditi into diagnostic consideration when unexplain abdominal or back pain, fever, and ileus accor panies other traumatic injuries.

References

1. Travers, B.: Rupture of the pancreas. Hospi Reports, St. Thomas' Hospital, London, Englar Lancet, 12:384 (June) 1927.
2. Naffziger, H. C., and McCorkle, H. J.: The r ognition and management of acute trauma to t pancreas; with particular reference to the use the serum amylase test. Ann. Surg., 118:594-6 (Oct.) 1943.
3. Popper, H. L., and Necheles, H.: Pancreatic juries, an experimental study. Surg., Gynec. Obst., 93:621-624 (Nov.) 1951.
4. Popper, H. L.: Consequences of section of t pancreatic ducts: an experimental study. Sur Gynec., & Obst., 88:254-258, 1949.
5. Warren, K. W.: Management of pancreatic juries. S. Clin. North America, 789-802 Jun 1951.

HEMIHYPERTROPHY AND HEMIHYPOPLASIA

(Continued from Page 461)

the abnormal half, and he may be unable to determine whether the distortion results from hemihypertrophy or hemihypoplasia. While such ignorance may be embarrassing, it is minor, indeed, compared to the abysmal ignorance that surrounds the etiologic factors[2] concerned in these anomalies.

References

1. Rudolph, C. E., and Norvold, R. W.: Conger partial hemihypertrophy involving marked maloc sion. J. Dent. Res., 23:133-139 (April) 1944.
2. Gesell, Arnold: Hemihypertrophy and twinning further study of the nature of hemihypertrophy report of a new case. Am. J. M. Sc., 173:542- (April) 1927.

eminar

HE PYRROL PIGMENTS AND HEMOGLOBIN CATABOLISM

C. J. WATSON, M.D.
Minneapolis, Minnesota

(Concluded from June Issue)

epresentation of Hemoglobin Catabolism by Pyrrol Pigment Excretion

On the basis of well-established structural re- ionships one gram of hemoglobin can give rise approximately 34.7 milligrams of bilirubin and .1 mg. of mesobilirubinogen. Thus 100 gm. of moglobin yields 0.34 gm. iron representing four olecules of heme (ferrous protoporphyrin). The me molecule ($C_{34}H_{34}N_4O_4Fe$) weighs 618, otoporphyrin 562, bilirubin 584 and meso- irubinogen 592. 1 gm. of hemoglobin theoreti- lly provides 37.5 mg. heme, 33.4 mg. protopor- yrin, 34.7 mg. bilirubin and 35.1 mg. meso- irubinogen. A slightly larger amount of ster- bilinogen, and slightly smaller amounts of d- obilinogen or dihydromesobilirubin are provided. om the standpoint of urobilinogen group ex- etion it is believed best to employ the figure for esobilirubinogen. On the basis of the figure just ven, 100 mg. of mesobilirubinogen is equivalent 2.85 gm. hemoglobin. The figure of 2.39, given arly twenty years ago[26] and based on Eppinger's ta,[22] is thus seen to be too low. Taking this rrection into account, the normal value for W, e apparent hemoglobin wastage represented by e daily fecal urobilinogen in relation to total culating hemoglobin,[26] is proportionately in- eased to a normal range of 0.5 to 0.7 per cent r day. While recognizing that this figure is obably still too low, it is true that use of the lue W is often quite helpful in the more exact aluation of urobilinogen excretion as related to e problem of anemia.

If it were clear that all of the protoporphyrin in the hemoglobin molecule were converted to bilirubin, that all of the bilirubin were excreted in the bile and thence into the intestine to be reduced in toto to the urobilinogen group and that all of the urobilinogen group was then excreted in the feces, the situation would be relatively simple and one could make an exact calculation of the rate of hemoglobin catabolism. The problem, however, is by no means as simple as this. There is first of all the possibility to be reckoned with that some fraction of the protoporphyrin is at once split into smaller fragments than bilirubin so that it would not be represented in the bilirubin of the bile or the urobilinogen of the feces. Bingold[93] has been the chief proponent of a theory that a certain fraction of the circulating hemoglobin is destroyed by the kidney. According to this concept, an unknown proportion of the protoporphyrin is split into two dipyrrylmethenes which then appear in the urine as colorless chromogens and may be detected by the "pentdyopent" reaction. This simply refers to a pink color reaction with an absorption band at 525 mμ observed after alkalinization and heating of the urine and addition of sodium hydrosulfite. Bingold demonstrated that the same reaction is observed if hemin is oxidized with hydrogen peroxide, then treated with sodium hydrosulfite. This is also true of human blood if first heated to 72° C. Bingold believed that the heat destroyed the catalase of the red cells thus exposing the hemoglobin to the oxidative activity of hydrogen peroxide. Goose blood, in which there is but little or no catalase, is decolorized by peroxide without preliminary heating. According to Bingold this is also true of the urine from human cases of hemoglobinuria, explained as due to a removal of catalase by the kidney.

Pentdyopent is also formed from bilirubin and urobilin (i- or d- but not l-), and indeed it seems

---

The first E. T. Bell Lecture of the Minnesota thological Society.

From the Department of Medicine, University of innesota Medical School and Hospital, Minneapolis. ie studies in this laboratory have been supported in rt under contracts with the Surgeon General's Office, S.A., and the Atomic Energy Commission. Presented part at the meeting of the Minnesota Pathological ciety, October 18, 1955.

This lecture has appeared in three installments, of iich this is the third.

likely that its presence in the urine is more often associated with degradation of one of these substances. Nevertheless it has been observed in the absence of either bilirubin or urobilinogen, and Bingold believed that he was able to demonstrate it in the circulating red blood cells. He thought. however, that this might be related to anabolism rather than catabolism. There is no further information on this point. Although Stich has mentioned methods of quantitative determination of pentdyopent, exact techniques have not been described, and our own attempts† to estimate the substance in the urine have met with failure due to the capricious nature of the reaction itself, the lability of the substance and the many variables which influence the intensity of the color development. The color reaction in the urine is seldom intense enough to suggest that any important fraction of the destroyed hemoglobin for the period of time involved was represented. While the pentdyopent reaction undoubtedly indicates a catabolism to smaller molecules than urobilinogen, it is not believed to have appreciable significance from a quantitative standpoint. Nevertheless its presence might conceivably indicate that some larger fraction of the porphyrin or bile pigment moiety is being converted to other dipyrrylmethenes or smaller molecules not revealed by the pentdyopent reaction. Thus, mesobilifuscin, to be discussed in the following, is a naturally occurring dipyrrylmethene which does not give the pentdyopent reaction.

Except for the possibility that a small fraction of the destroyed hemoglobin is at once converted to a dipyrrylmethene such as represented by pentdyopent, rather than to bilirubin, there is no available evidence that the bilirubin excreted in the bile does not represent hemoglobin catabolism in nearly quantitative fashion. No reliable evidence has been brought forward that any fraction of the bilirubin formed in the body is destroyed and reutilized. In the presence of regurgitation jaundice, of course, variable amounts of bilirubin are excreted in the urine, and in any patient with jaundice some portion of the bilirubin being formed remains for variable periods in the blood and tissues. Except for these abnormal situations, however, there is every reason to believe that bilirubin is efficiently excreted by the liver into the bile. As already mentioned, we have only fragmentary information about the amount f bilirubin in the twenty-four-hour bile of hum beings. There are many observations on bilirubin content of gall bladder bile, fistula in the presence of a T tube, and duodenal c tents under varying circumstances, but these obviously of limited value. The available d have recently been reviewed by With.[23] So fa can be determined, only the observations f Eppinger[22] are reasonably acceptable on the b of relating to the whole bile in instances of t l biliary fistula in relatively normal human bei Eppinger[22] found 300 and 370 mg. per twe four hours in these two individuals. The amo t of the total circulating hemoglobin was not de mined. If one assumes that it was 750 gm. (bl d volume of 5 liters with 15 gm. of hemoglobin r 100 cc.) a red cell life span of approxima y seventy-seven days may be calculated. Thi s shorter than the value of 120 days which in rec t years has been determined by various investiga s employing tagging with N_{15}, Cr_{51}, Fe_{59}, sulfhe globin or immunological methods of the As v type. Nevertheless, Evans has recently postula d an average life span of 90 to 100 days on the b s of two populations of red cells, a very short li d group living four to five days and a larger gr p living in the neighborhood of 120 days.[95] Ev s' calculations were based on several unpro n assumptions which may or may not be va l. Evans also believes that earlier data of Finch d associates,[96] when employed in his calculat n, provide further evidence of shorter lived red c ls in normal individuals. Finch's data were obtai d by means of intravenous administration of Fe_5

Although Eppinger's values for bilirubin w e based on a spectrophotometric method, it is possible, as the bilirubin absorption is rather n-specific, that other substances were included d that his values were somewhat too high. I is evident that studies with modern technique in cases of total biliary fistula, otherwise in relati ly good health, are very much needed. Such pati ts have become extremely rare as nowadays e establishment of a complete external biliary fis la is generally regarded as undesirable even i a patient with inoperable carcinomatous biliary b-struction (it is obvious that for the purpos of measuring the total bilirubin excretion a comp te biliary obstruction would be essential).

For a normal individual such as just refe ed to. having a total circulating hemoglobin of 5 rns, a red cell life span of 100 days would unt for 260 mg. per day of bilirubin in the i if the foregoing assumptions are valid. For fe span of 120 days about 216 mg. per day ld be provided. As will be noted in a moment, he is recent evidence which has been thought ndicate that not all of the bilirubin in the bile he resultant urobilinogen of the feces is de- d from destruction of the hemoglobin in ure circulating red blood cells. The published a for the daily urobilinogen excretion[97] in the es have consistently given values lower than e just discussed for the bilirubin of the bile. ile the question of bilirubin reabsorption from intestine cannot be answered with finality, the ority of evidence indicates that it is negligible occurs at all. There is general agreement that urobilinogen in the feces in twenty-four hours ignificantly lower than the amount of bilirubin the bile. If Eppinger's figure of 300 and 370 . is accepted, it is clear that the deficit would considerable. In 1936[97] the author reported average of 180 mg. per day for seventeen mals. Of these, however, but two were females. thermore, the method employed at that time not as precise as that which has been used e 1944.[98] Heilmeier and Oetzel[99] had pre- usly reported 146 mg. per day as the average ue in fourteen normals of both sexes. Quite ently Dr. Sigrid Gilbertsen in this laboratory obtained a mean value for both sexes of 140 . per day. It is seen in any event that even if accepts a figure of 210 to 260 mg. per day the bilirubin of the bile, a figure which, as t seen, would correspond with a life span of the l cells of 100 to 120 days, there is a significant icit between bilirubin and urobilinogen to be counted for. Several possibilities require con- eration:

---

†With S. Schwartz, unpublished.

1. Incomplete reduction of bilirubin to the bilinogen group. It has already been noted t even normal feces contain significant amounts bilirubin. This in itself suggests that inter- diaries, such as mesobilirubin and dihydro- sobilirubin might also be present. Both of these ve indeed been identified in feces containing inly d-urobilinogen,[77] but, as already mentioned, appears quite likely that the latter may be a rmal intermediary compound on the pathway to rcobilinogen, also that it may be isomeric with hydromesobilirubin. It should be noted that the latter substance also exhibits an Ehrlich reaction so that it would contribute to the colorimetry of urobilinogen based on this method, yet no information is available as to comparative optical density of its aldehyde compound. It is believed quite unlikely that the contribution of dihydromesobilirubin to the total Ehrlich reaction for urobilinogen, is very large, though, obviously, further studies of this question are needed. It appears that dihydromesobilirubin does not form a urobilin; at least when subjected to the iodine conversion method in petroleum ether,[80] only mesobiliviolin has been observed.** W. C. Meyer[86] has suggested, however, that dihydromesobilirubin may be the precursor of a third urobilin which he has observed, one characterized by a copper reaction differing from that of urobilin or stercobilin. No further information about this compound is thus far available.

2. Reabsorption of members of the urobilinogen group with chemical alteration or reutilization. As already mentioned, there is strong evidence of an enterohepatic circulation of urobilinogen but no evidence that it is reutilized in heme synthesis. In fact, London, employing N_{15} tagging, was unable to find any evidence of reutilization.[100] If one assumes that from 50 to 100 mg. of the total urobilinogen group are reabsorbed from the colon and returned to the liver each day in a normal adult, one would expect that if there were a complete enterohepatic circulation, a corresponding concentration in the normal bile would be found. The observations of Jankelson[101] and Sborov,[102] together with many older observations as reviewed in considerable detail by With,[23] indicate that the amount of urobilinogen group substances in the bile is relatively quite small, probably not more than 1 per cent of the fecal urobilinogen. Thus if the discrepancy between bile bilirubin and fecal urobilinogen is due to partial reabsorption of urobilinogen, it follows that this fraction must undergo alteration or destruction in the liver or elsewhere in the body so that it is no longer detectable as urobilinogen. In this connection it is of some importance that liver homogenate was shown by Felix and Moebus[103] to cause a rapid disappearance of added mesobilirubinogen. Another possibility which would explain the discrepancy is that some fraction of the bilirubin or urobilinogen group derived from it is split into smaller mole-

---

**Unpublished observation with P. T. Lowry.

cules. This is a very important question, and I will attempt to deal with it in a moment in relation to the problem of bilifuscin and mesobilifuscin.

First, however, it is desirable to give some attention to the interesting question as to whether all of the fecal urobilinogen is derived from the destroyed hemoglobin of circulating red blood cells. In the earlier literature one finds this assumed by Eppinger and Charnas,[104] but strongly doubted by George Whipple,[105] who first conceived the idea of a "pigment pool" from which unused pigment such as bilirubin or urobilin might be excreted without having been in the hemoglobin molecule. Whipple[105] and Castle and Minot[106] both favored the idea that in pernicious anemia there is a faulty utilization of pigment because of the maturation arrest in the bone marrow, with resulting accumulation and excessive excretion. Our own data in pernicious anemia, obtained with Jones,[107] supported this view. In this latter study it was observed that in pernicious anemia in relapse the hemoglobin level often remained relatively static despite marked excesses of urobilinogen in the feces and at the same time without any increase of the reticulocyte percentage, indeed with marked reduction of the absolute reticulocyte count. In other words, a striking imbalance between the apparent rates of destruction and regeneration, which by simple calculation ought to have produced a much more rapid decline of the hemoglobin level, nevertheless failed to do so. It was concluded on this basis that a considerable fraction of the fecal urobilinogen in pernicious anemia in relapse was derived from sources other than the hemoglobin of destroyed circulating erythrocytes.[26] Prior to this, Jedlicka[108] suggested that the excessive pigment excretion in pernicious anemia might be due to fabrication and destruction of unused hemoglobin in the bone marrow. Evidence for this was lacking, although in some respects it was an attractive hypothesis. It should be noted that Heilmeier believed that fecal urobilinogen excretion in pernicious anemia corresponded well with the rate of decline of the total circulating hemoglobin and on this basis he assumed that it represented simply excessive hemolysis.[109] For reasons that are not clear London and West[110] have ascribed to us, rather than Heilmeier, the assumption that all of the bile pigment excreted in pernicious anemia is from destroyed hemoglobin. As noted above, our earlier obsen tions[26,107] indicated that this was not the case.

The studies of London and co-workers[3,110] w N_{15} glycine have gone far in clearing up th questions. In following N_{15} in the fecal st cobilin of normal subjects, after administration N_{15} glycine, it was found that there were t peaks, one very early, representing 15-20 per c of the total stercobilin, and the other at t expected interval of 120 days, that of the l span of normal red cells. The first peak has r been adequately explained, although the gene view is that it relates to the formation of exc pigment in accordance with the "pigment po concept of Whipple.[105] The possibility must a be considered that it represents destruction hemoglobin which, in the sense of Jedlicka has not entered the circulation, or that it rep sents hemoglobin of young red cells which do en the circulation but which are destroyed withir short time either because they represent compen tion in excess, or for other reasons. It is, course, possible that only the exact number red blood cells are released into the circulat which are needed to replace those that have be destroyed on any given day. However, natı is lavish and often compensates in excess. comparison with many other natural proces which are better understood, it would scarcely surprising if an excessive number of reticulocy were delivered each day, some shortly destir for destruction.

London and West's observations in pernici anemia in relapse[110] indicated that about 60 cent of the fecal stercobilin was derived fr sources other than mature circulating erythrocy At the same time this study indicated that th was also a random destruction of circulating cells of moderate degree, the life span being duced to about eighty days. In view of what already been said, it is quite probable that hemolytic factor in pernicious anemia is less portant and that a considerable fraction of total pyrrol pigment is fabricated and not us quite in the sense of Whipple's "pigment po It remains to be determined whether, because its peculiar characteristics in respect to the meg blastic bone marrow and maturation arrest, nicious anemia and perhaps other megalobla anemias are the only conditions in which obtains, in other words whether the smaller portions noted in the early period in the nor lividual and in other diseases are on a different sis, as has just been considered.

Dipyrrylmethene Problem

Finally it is well to consider the possible signifi- ance of dipyrrylmethene formation, which was uded to in the foregoing. At the time ster- bilin was first crystallized from the feces in 32[67,88] the author noted that it was accompanied considerable amounts of a dark brown pig- nt of differing behavior and solubility charac- istics, designated then as "copronigrin."[68] In- ad of a sharply defined absorption band with ximum at 495 mμ, it presented broad diffuse sorption of ill defined character extending from out 500 mμ on down into the blue. It did t exhibit the characteristic green fluorescence the urobilin group with zinc acetate but instead ecipitated as an insoluble zinc complex. It was o observed at that time that similar charac- istics were exhibited by what Fischer had rlier designated as "Körper II," a brown pig- ent appearing during the amalgam reduction of irubin to urobilinogen.[57] Although the similarity s recognized, no further studies were made, and remained for W. Siedel[111,112] to provide detailed formation as to the character of these com- unds. His studies leave no doubt that the sub- nce from feces which the author had called opronigrin," purely in a descriptive fashion, and scher's "Körper II," are closely related if not entical. His analyses of the latter agreed with e formula of a dipyrrylmethene to which he ve the name "mesobilifuscin," the prefix meso nply indicating that the vinyl groups present in e original bilirubin molecule had been reduced ethyl groups.

Siedel also isolated "bilifuscin," the dipyrryl- ethene with the structure which one would antic- ate if bilirubin itself were split in half. It is interest that Städeler, who first crystallized lirubin in 1864, observed an accompanying own impurity to which he gave the name ilifuscin."[113] This was repeatedly observed in e ensuing years, but Siedel was the first to entify it as a dipyrrylmethene and the immedi- e precursor of the mesobilifuscin which has just en discussed. Siedel isolated bilifuscin from llstones and showed that it was readily reduced the meso-compound. There is no reason to ubt that the bacterial flora of the colon can so effect this change, just as they reduce bilirubin to mesobilirubinogen and farther. Later, Siedel and co-workers[112] observed that the majority of the mesobilifuscin in the feces is excreted as a colorless chromogen which was named "mesobilileukan" or "promesobilifuscin." Siedel believed that there were two isomers both of the chromogen and the pigment, and that the pigment molecule polymerizes in varying degree, the size of the polymer relating to the solubility in chloroform and other organic solvents.

The fact that the bilifuscins and mesobilifuscins have not been crystallized and therefore perhaps not adequately purified induced Dobeneck[114] to question whether Siedel's conclusions, as just referred to, are entirely valid. Dobeneck doubted the conclusion that the mesobilifuscin, or "Körper II" as obtained *in vitro,* was identical with the pigment from the feces. This question cannot be answered until further purification has been achieved. Nevertheless from a practical standpoint there is little doubt that one or more mesobilifuscins accompany the urobilinogen and urobilin group in the feces. Indeed the fuscins are probably of greater importance for the brown color of the feces than are the urobilins. In the freshly passed stool the colorless urobilinogens greatly predominate over the orange-yellow urobilins and it is obvious that neither could well be responsible for the brown color. The fuscin color is extremely intense and dark and although much of the fuscin is excreted as a chromogen, a small amount of the pigment would suffice to produce the brown color.

There are a number of important questions about the dipyrrylmethenes in respect to hemoglobin catabolism. As we have already seen, the substance which Bingold designated as "pentdyopent" is undoubtedly a dipyrrylmethene derived from hemoglobin and occurring in small amounts in some urine samples, mainly as a result of splitting of bilirubin or one of its immediate tetrapyrryl derivatives. It is clear, however, that pentdyopent differs from bilifuscin or mesobilifuscin (Mbf) or their respective chromogens. The latter do not exhibit the characteristic absorption spectrum of pentdyopent nor the corresponding pink color. Pentdyopent has not been observed in the feces. Bilifuscin has been identified in bilirubin containing urines,[112] but there is much reason to believe that in this location, at least, it represents a chemical artefact from the splitting of bilirubin either in the urinary tract or after the urine has been voided. It is not yet clear to what extent the mesobilifuscin of the feces owes its formation to a splitting of bilirubin or one of its immediate tetrapyrrl derivatives in the intestinal tract, or whether some fraction of the hemoglobin protoporphyrin or the bilirubin derived from it is split to bilifuscin prior to its excretion in the bile. Recent studies* with Dr. Sigrid Gilbertsen and Miss Hawkinson have shown that feeding of N_{15} labeled mesobilirubinogen in human subjects results in a variable degree of labeling of the fecal Mbf. On the other hand, a study with Lowry* has yielded conflicting data. No labeling of the fecal Mbf was found at the time of the second peak for stercobilin (ca. 120 days), following administration of N_{15} glycine. Marked labeling was observed, however, at the time of the first N_{15} peak of the stercobilin, a few days after the glycine was given. This is receiving further study at the present time.

If the fecal Mbf were shown to be simply a type of chemical artefact derived from the splitting of bilirubin or members of the urobilinogen group in the intestinal tract, this might well account for the discrepancy which has already been noted between the amount of bilirubin in the bile and urobilinogen in the feces per day. In any event, it is clear that the fecal mesobilifuscin is not quantitated with the urobilinogen and in the past has been omitted completely in considerations of bile pigment excretion based on fecal urobilinogen determination. Studies of this problem have been in progress in this laboratory for some time. With Dr. Sigrid Gilbertsen and Miss Hawkinson an attempt is being made to determine the urobilinogen-mesobilifuscin (U-Mbf) ratio in health and in certain disease states.* Admittedly the method used for mesobilifuscin is not precise, and because of the possibility of varying polymerization, it is impossible to be certain that the values which are obtained relate consistently to a homogeneous compound having the same optical density. Our data thus far indicate, however, that the U-Mbf ratio under normal circumstances is relatively constant and that there are significant variations under the circumstances of certain disease states. In the main the ratio in the normal feces is in the neighborhood of 10:1. In certain hemolytic states a ratio as low as 1:1 has been observed. It is of interest, though not yet explained, th in two cases of cholecystocolic fistula where t bile gained access to the colon directly, the U-M ratio was about 50:1.

From the standpoint of detecting an increas rate of hemoglobin catabolism in human disea the Mbf determination has not thus far provid essentially different conclusions than those whi would have been reached on the basis of fe urobilinogen determination alone. In some stances it has thrown additional light on t magnitude of the total pigment excretion. One the principal objectives at the outset of the stu was to determine whether the value would at tin provide evidence of increased hemolytic activ in certain disease states in which it has been ported that the Cr_{51} life span of the red cell v shortened despite a lack of increase of the fe urobilinogen. Such a difference has been repor by others, especially in cases of leukemia,[115] li disease[116] and certain other conditions. Dr. P Hagen, in this department, has been especi interested in comparing fecal urobilinogen w Cr_{51} life span measurements.* While it is t that these were selected cases of hemolytic dise he has not thus far observed an instance in wh a decreased life span by the chromium meth was not associated with an increase of the fe urobilinogen, at least when the latter was ta into account with the total circulating hemoglob Capps[116] has observed several cases of hep c cirrhosis in which the Cr_{51} life span was appare somewhat shortened, without increased u- bilinogen excretion. Dr. Gilbertsen has m e similar observations in a few instances. Jand however, reported excellent, general agreem between the two measurements in patients w cirrhosis.

Summary

It would be difficult to summarize adequa and with sufficient brevity the material tha I have attempted to cover in this lecture. Fi re 6 is presented in the hope that it may parti accomplish this purpose. As noted, the pla in Figure 6 does not attempt to decide whether normal catabolic pathway from hemoglobin to pigment is via a green hemoglobin or hemati or perhaps both. The same may be said of the t n- sition of bilirubin to urobilinogen, in respec to urobilinogen and dihydromesobilirubin. The ncept of the urobilinogens and urobilins as a oup of similar but clearly distinct substances is emphasized. From the clinical point of view it believed that the distinction of members of the oup is not of significance in characterizing ifferent disease states as, for example, hemolytic . hepatic diseases. All of the older and more cent studies in this laboratory have clearly sup- orted the view that the urobilinogens are repre- ntatives of a stepwise reduction of bilirubin by e intestinal bacterial flora. While these studies o not exclude an hepatic formation of meso- ilirubinogen, they have not supported such a oncept and have indicated that it is relatively nimportant if, indeed, it occurs at all.

---

*To be published.

*To be published.

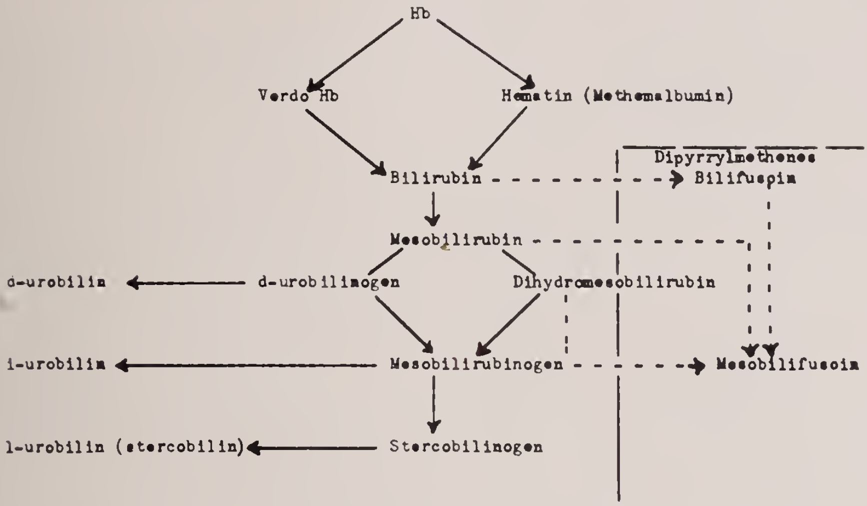


Fig. 6. Survey of the (bile pigment) products of hemoglobin catabolism.

Recent studies of the serum bilirubin and the an den Bergh reaction, notably the observations f Cole and Lathe, fully confirm the concept of a undamental difference between the direct and the elayed or indirect reacting types, the exact basis f which is still unknown. From the standpoint f diagnosis the value of the fractional (one inute and total) serum bilirubin determination, s employed in this laboratory for a number of ears, is fully supported.

It is evident that it has not thus far been ossible to cast an exact balance between the atabolic excretory products of heme and the aily wastage of hemoglobin. Further studies are eeded relative to the importance of the dipyrryl- nethene group and the amounts of bilirubin, mesobilirubin and dihydromesobilirubin in the feces. Much more information is also needed as to the significance of the early peak of N_{15} in the fecal stercobilin, following administration of N_{15} glycine. These are but some of the more important aspects of problems that have been considered.

References

92. Gohr, H.; Görges, Th., and Bolte, A.: Untersuchungen über den Einfluss von Terramycin, Aureomycin und Resulfon auf die bakterielle Reduktion des Bilirubins im Darm, zugleich ein Beitrag zur Frage der Urobilinogenentstehung. Ztschr. f. d. ges. inn. Med., 7:372, 1952.
93. Bingold, K.: Über die Bedeutung von Katalase und Hydroperoxyd für den Blutstoffwechsel. Dtsch. Arch. f. klin. Med., 177:230, 1935.
94. Bingold, K.: Über das Schicksal des überalterten Blutfarbstoffes im Organismus. Ztschr. f. d. ges. exp. Med., 99:325, 1936.
95. Evans, R. T.: Shortlived red cells in normal individuals. Nature, 173:129, 1954.
96. Finch, C. A.; Gibson, J. G.; Peacock, W. C., and Fluharty, R. G.: Iron metabolism-Utilization of intravenous radioactive iron. Blood, 4:905, 1949.
97. Watson, C. J.; Studies of Urobilinogen. I. An improved method for the quantitative estimation of urobilinogen in feces and urine. Am. J. Clin. Path., 6:458, 1936.
98. Schwartz, S.; Sborov, V., and Watson, C. J.: Studies of urobilinogen. IV. The quantitative determination of urobilinogen by means of the Evelyn photoelectric colorimeter. Am. J. Clin. Path., 14:598, 1944.
99. (a) Heilmeyer, L.: Blutfarbstoffwechselstudien. I. Mitt. Probleme, Methoden, und Kritik der Whippleschen Theorie. Dtsch. Arch. f. klin. Med., 171:121, 1931. (b) Heilmeyer, L., and Oetzel, W.: Blutfarbstoffwechselstudien. II. Ergebnisse bei Gesunden. Diätversuche. Der Blutfarbstoffwechsel im Hunger. Dtsch. Arch. f. klin. Med., 171:365, 1931.
100. London, I. M.: Personal communication.

101. Jankelson, I. R.: Urobilinogen in human bile. Gastroenterology, 3:292, 1944.

102. Sborov, V. M., and Sharon, W. S.: Pigments of the bile in liver and gall bladder disease. Am. J. Med., 14:524, 1953, and personal communications.

103. Felix, K., and Moebus, H.: Das Verhalten von Urobilinogen in der Leber. Ztschr. f. d. ges. exp. Med., 85:369, 1932.

104. Eppinger, H., and Charnes, D.: Was lehren uns quantitative Urobilinbestimmungen im Stuhl? Ztschr. f. klin. Med., 78:387, 1913.

105. Whipple, G. H.: Pigment metabolism and regeneration of hemoglobin in the body. Arch. Int. Med., 29:711, 1922.

106. Castle, W. B., and Minot, G.: Pathological physiology and clinical description of the anemias. New York: Oxford University Press, 1936.

107. Watson, C. J., and Jones, O. P.: Pernicious anemia and liver therapy. Univ. Minnesota Staff Bull., 7:339, 1936.

108. Jedlicka, V.: Über die Lebertherapie und das Wesen der perniziösen Anämie. Folia haematol., 42:359, 1930.

109. Heilmeyer, L.: Blutfarbstoffwechselstudien. v. Mitt. Der Farbstoffwechsel beim hämolytischen Ikterus und einigen hämolytischen Anämien verschiedener Genese. Wirkungen des Leberstoffs und peroral Milzverabreichung. Dtsch. Arch. f. klin. Med., 172:628, 1932.

110. London, I., and West, R.: The formation of bile pigment in pernicious anemia. J. Biol. Chem., 184:359, 1950.

111. Siedel, W.; v. Pölnitz, W., and Eisenreich, F.: Bilifuscin und Mesobilifuscin als natürlic Abbauprodukte des Blutfarbstoffes; über Vorko men und Bildung. Naturwissensch., 34:314, 194

112. Siedel, W.; Stitch, W.; and Eisenreich, F.: P mesobilifuscin (Mesobilileukan) ein neues phys logisches Abbauprodukt des Blutfarbstof Naturwissensch., 35:316, 1948.

113. Städeler, G.: Über die Farbstoffe der Galle. Ar d. Chem., 132:323, 1864.

114. (a) Dobeneck, H. v.: Diskussionsbemerku Naturwissensch., 35:221, 1948. (b) Dobeneck, v.; Stellungnahme zur Erwiederung. Prof. Dr. Siedels auf meiner Diskussionsbemerku Naturwissensch., 36:221, 1949.

115. (a) Weinstein, I. M., and LeRoy, G. V.: Rad active sodium chromate for the study of surv of red blood cells. II. The rate of hemolysis certain hematologic disorders. J. Lab. & Cl Med., 42:368, 1953. (b) Berlin, N. I.; Lawren J. H., and Lee, H. C.: The pathogenesis of anemia of chronic leukemia: measurement of life span of the red blood cell with glycine-2- J. Lab. & Clin. Med., 44:860, 1954.

116. (a) Capps, R. B.; Weinstein, I. N.; Ettinger, H., and Jones, P. N.: Red cell survival studies liver disease. Tr. A. Am. Phys., 67:133, 19 (b) Jones, P. N.; Weinstein, I. M.; Etting R. H., and Capps, R. B.: Decreased red survival associated with liver disease. Arch. Med., 85:93, 1955.

117. Jandl, J. H.: The anemia of liver disease: servations on its mechanism. J. Clin. Invest 34:390, 1955.

BRONCHOGENIC CARCINOMA WITH UNUSUAL PRESENTING SYMPTOMS

(Continued from Page 464)

2. Whiteley, H. J.: Intra-auricular spread of bronchogenic carcinoma. J. Path. & Bact., 63:753-754 (Oct.) 1951.

3. Entieknap, J. B.: An analysis of 1000 cases of cancer with special reference to the metastases. Guy's Hospital Rep., 101:273-279, 1952.

4. Ritchie, G.: Metastatic tumors of the myocardium. Am. J. Path., 17:483-489 (July) 1941.

5. White, P. D.: Heart Disease. 4th ed., pp. 592-595, 1951.

6. Ellman, P.: Unusual manifestations of bronchial carcinoma. Proc. Roy. Soc. Med., 46:851-858 (Oct.) 1953.

7. Logue, J. T.: Osteoarthropathy and simple clubbing. US Armed Forces M. J., 6:1627-1631 (Nov.) 1953.

8. Berk, M.: Chronic idiopathic hypertrophic osteoarthropathy. New England J. Med., 247:123-126 (July 24) 1952.

9. Bloom, W.: Pituitary implications in hypertrophic pulmonary osteoarthropathy. Ann. Int. Med., 29: 361-370 (Aug.) 1948.

10. Mauer, E. F.: On the etiology of clubbing of fingers. Am. Heart J., 34:852-859 (Dec.) 1947.

11. Fried, B. M.: Chronic pulmonary osteoarthropat dyspituitarism as a probable cause. Arch. Int. M 72:565-580 (Nov.) 1943.

12. Poppe, J. K.: The diagnostic significance clubbed fingers. Dis. Chest., 13:658-662 (N Dec.) 1947.

13. Flavell, G.: Some unusual manifestations of br chial carcinoma. Brit. J. Tuberc. & Dis. Che 47:135-141 (July) 1953.

14. Wierman, W. H.; Clagett, O. T., and McDon J. R.: Articular manifestations in pulmonary ease. J.A.M.A., 155:1459-1463 (Aug. 21) 1954

15. Ray, E. S., and Fisher, H. P., Jr.: Hypertrop osteoarthropathy. Ann. Int. Med., 38:239- (Feb.) 1953.

16. Pattison, J. D.; Beak, E., and Miller, W. Hypertrophic osteoarthropathy in carcinoma of lung. J.A.M.A., 146:783-787 (June 30) 1951

Current Concepts

ERIPHERAL ARTERIAL EMBOLISM

FREDERICK M. OWENS, JR., M.D.
Saint Paul, Minnesota

Recent improvements in techniques of blood ssel surgery have stimulated interest in the aluation of the treatment of arterial emboli. lthough successful embolectomy dates back to 911 when Labey[1] reported the first surgical suc- ss, the problem of treatment of arterial em- olism has not yet been completely solved. Until 934 the emphasis of treatment was upon surgery, ut with the influence of Denk,[2] who introduced apaverine, of J. C. White,[3] also Leriche and ontaine[4] who introduced lumbar sympathetic locks and in 1936 of Murray[5] who introduced nticoagulants, the trend changed to conservatism. s one would expect, the pendulum has now wung back to a preference for surgical treatment. his has been stimulated by the ever increasing rgical interest in vascular diseases.

Survey of the literature reveals that most papers onsist of reports of relatively few cases. The est overall picture of the situation is obtained om the paper by Haimovici[6] in 1950, in which e reported 330 cases of peripheral arterial em- olism in 228 patients; and from the paper of arren, Linton and Scannell[7] in 1954, reporting 37 emboli in 200 patients.

Etiology

The etiology of peripheral arterial embolism has een well established as being a complication rimarily of rheumatic heart disease or myocardial nfarction. Infrequently the etiology may be ubacute bacterial endocarditis, pulmonary vein hrombosis, or undetermined. The site of the of- ending thrombus lies in the left auricular ap- endage in cases of auricular fibrillation. The ft ventricle is the source of the embolus in cases here a mural thrombus has formed upon in- rcted myocardium. The aorta is the source of he embolus in instances in which a plaque or thrombus on a plaque has become dislodged and has migrated distally in the arterial tree. Warren reports the source as undertimed in 12.5 per cent of cases, while Haimovici states that the undetermined group make up 3.1 per cent of cases.

Site of Lodgment of Emboli

The lower extremity vessels are the sites of lodgement of emboli in more than 75 per cent of cases. Warren found the figure to be 76.2 per cent, while Haimovici states that 84 per cent of peripheral emboli occur in the lower extremity and 16 per cent in the upper extremity. The frequency with which various arteries are involved are as follows: femoral, popliteal, common iliac, brachial, aortic bifurcation, axillary, external illiac, posterior tibial, anterior tibial, radial, ulnar.

In general, this picture seems to hold true throughout various reports. Multiple emboli may occur simultaneously as "showers" or at separate times in separate locations or the same location.

Pathologic Physiology

Sudden obstruction of the arterial tree by an embolus causes several physiologic events to take place. The obstruction itself, depending upon its location in the artery, may cause the death of the limb; however, collateral circulation may be such as to maintain the viability of the limb. Lodgment at arterial bifurcations is prone to lead to gangrene for in this location the collateral channels are more liable to occlusion than when the embolus lodges in the straight portion of a vessel.

Spasm of the adjacent arterial tree may be severe and may of itself be responsible for the death of the limb. Leriche and Fontaine[4] demonstrated that the spasm originates as a nervous reflex in the damaged arterial wall, spreading via the sympathetics to produce spasm not only of the main channels, but of the collaterals as well. Sympathetic block or sympathectomy effectively relieves this spasm.

Distal thrombosis in the arterial tree is the most difficult problem to handle in these cases. Soon after the stream of blood has been slowed by the lodgment of the thrombus, there begins development of a propagating distal thrombus which continues to the next collateral channel. If the blood flow is sufficiently impaired, the propagation continues into the distal arterial tree until it may occlude the entire arterial bed. Proximal extension of the clot may occur for the same reasons. The failure to clear the arterial tree of thrombus is the basis for failure of operative embolectomy in a high percentage of cases. Changes begin to take place in the intima of the artery at the site of the embolus soon after the lodgment of the clot. Within a relatively short time, these changes are irreversible. Studies in the dog show that the changes in the adventitia are more pronounced than in the media and intima.[8] This inflammation of the adventitia may be the stimulus which causes the vasospasm in the adjacent vessels. If changes progress to any great degree in the intima, all attempts to re-establish blood flow are doomed to failure.

Symptoms

The honored quintet of pain, pallor, paresthesias, pulselessness and paralysis cannot always be found. Most of the patients complain of sudden pain followed by numbness and coldness; however, about a fifth of the patients complain of numbness and coldness without initial pain. In a few cases, the embolism is apparently silent.

The initial pain is frequently located in the region of lodgment of the embolus. Later pain develops in the distal part of the extremity along with numbness, tingling and coldness.

Absence of pulsations is the most important sign and the site at which the pulsations disappear usually represents the location of the embolus. In some instances, vasospasm is so severe that the thrombus appears to lie proximal to its true site. Oscillometry reveals absence of oscillations distal to the embolus and increased oscillations proximal to the embolus.

Diagnosis

Diagnosis of arterial occlusion is usually relatively simple; however, the differential diagnosis between thrombosis and embolism is not alwa easy. The possibility of embolism is always prese in the person with heart disease and any co plaint referable to the limbs in cardiac patie should be attended to promptly to determine t possible presence of embolism. If one cannot di ferentiate between thrombosis and embolism, is better to err on the side of embolism, sin therapy cannot wait upon academic proof. Diagnosis of the site of lodgment of embolus important in the therapy and depends upon t site of initial pain, the site of disappearance pulses, the oscillometric readings, and knowled of the usual sites of lodgment of the embol In some instances, arteriograms may be a bene but in general this study is not necessary.

Prognosis

The fate of the limb depends upon the site occlusion, the degree of pathophysiologic chan associated with the lodgment of the embolus, t condition of the patient, and the delay in on of treatment. The incidence of gangrene in t lower extremity varies from 12 to 34 per c and in the upper extremity from 3 to 7 per ce It is often stated that embolism of the upper tremity never causes loss of limb, but statist belie this statement. Gangrene occurs in decre ing frequency in the following list of sites of e bolism:

Common Iliac	62.
Aortic Bifurcation	5.
Femoral	3
Popliteal	6.

The high percentage of limb survival in face of popliteal embolism prompts the adopt of a policy of non-surgical treatment rather t surgical exploration in most cases of poplit embolism.

The overall mortality varies considerably written reports. Warren[7] reports a mortality 27.8 per cent in 102 cases, with 165 emboli from 1947 through 1953. This figure repres a reasonable average for the larger series repor

Treatment

The treatment of peripheral arterial embol resolves itself into two primary categories, the surgical and the surgical methods of treatm

The non-surgical treatment consists of the of vasodilator drugs, sympathetic nerve inter on, anticoagulants, and physiotherapy. Vasodila- r drugs, such as priscolene or hydergine, benefit e local area by causing general vasodilatation. hese should be used to the point of tolerance the patient, but fall of blood pressure should avoided for a decrease of pressure reduces the ances for survival of the already comprised nb. Priscolene or hydergine are used in 25 g. or 50 mg. doses as often as every four urs. Because of variations of responses to the ug one should start with the smaller dose and crease the intake of the drug as it is tolerated the patient. Papaverine may be used in doses 0.03 mg. (gr. ½) intravenously or intramus- ularly every two to four hours.

Sympathetic nerve interruption by blocking with ovocaine is the most effective method of relieving isospasm and promoting maximum circulation the involved limb. Repeated sympathetic blocks e often necessary, but should not be undertaken hile the patient is receiving anticoagulants. If peated blocks are anticipated, it is wise to place small polythene catheter adjacent to the sympa- hetic trunk for repeated instillation of novo- aine. Surgical sympathectomy is an important djunct treatment to be employed when one does ot plan to explore the occluded artery. Sympa- hectomy may be done in the early stages to in- rease the chances for limb survival, or it may be one later to relieve the ischemic symptoms which nay follow the arterial occlusion.

Anticoagulant medication is probably the most mportant single factor in the treatment of periph- ral embolism for it acts to prevent the propa- ation of the clot which occludes the arterial tree eyond the site of the lodgment of the embolus. Heparin given intravenously as a continuous drip nade up by adding 200 mg. to 1000 cc. of 5 per ent glucose in water is the most effective and nost reliable method of interfering with the clot- ing mechanism of the blood. Administration of he heparin solution is started at 15 to 20 drops minute and is controlled by checking the clotting ime by the Lee-White method. The clotting ime should be maintained at twice normal. When he decision is made not to undertake exploratory peration, the patient can be switched to tromexan r dicoumarol for continuation of anticoagulant herapy for a period of two or three weeks. The prothrombin time should be kept at 20 to 25 per ent of normal. Excellent results have been reported in the literature with the use of anticoagulants. Haimovici[6] reports recovery of 10 out of 12 cases, attributing the success to anticoagulants.

Physiotherapy plays little part in the recovery from acute embolism. The avoidance of heat and elevation is of paramount importance! The metabolism of the tissues is increased by heat, but the tissues are not adequately supplied with blood to maintain the increased metabolism and necrosis of tissue is enhanced. Refrigeration is unwise for it may lead to irreversible changes in the tissues. The pavex boot and the use of intermittent venous occlusion have largely been discarded as not adding to the treatment of embolized limb.

The surgical treatment consists of exploration of the artery at the point of occlusion at the earliest possible moment. The chances of limb survival are infinitely greater if operation is carried out within twelve hours of the time of embolization than if the operation is delayed longer than twelve hours. Warren, Linton, and Scannell report that embolectomy within twelve hours led to recovery in 63.1 per cent of cases, while embolectomy done between twelve hours and forty-eight hours led to recovery in only 22.2 per cent of cases.

As has just been indicated, early embolectomy is of paramount importance. Direct exposure of the artery at the site of embolus gives much greater chance for success than proximal exposure with attempt to extract clot from a distance. Gentleness and avoidance of trauma to the vessel, particularly to the intima, increases the likelihood of success. Careful closure of the arteriotomy decreases the chances of thrombosis of the vessel in the postoperative period. Linton advises occlusion of the distal artery to prevent dislodgement of the embolus. On the contrary, proximal control of the vessel to release the pressure on the embolus is of greatest importance. Proximal and distal control are mandatory after the release of the obstruction in any open vessel, but free bleeding should be obtained from both ends of the vessel at the time of arteriotomy. Routine flushing of the distal arterial tree with heparin in saline solution (100 mg. of heparin in 500 cc. saline) is carried out on this service after embolectomy, unless the backflow is very brisk from the distal vessels.

The use of anticoagulants in the postoperative period is limited to those patients in whom there is some decrease of arterial blood flow indicating that the distal arterial tree has not been completely cleared of thrombus in spite of careful suction and milking of the leg.

For the sake of illustration we have chosen a case of embolism of the brachial artery to illustrate several points.

Case Reports

Case 1.—J. V., a white man, aged fifty-two years, had been known to have had auricular fibrillation for twelve years. In 1940, he had undergone subtotal thyroidectomy for exophthalmic goiter. In 1946, he was hospitalized for a short period of time because of congestive heart failure.

On October 11, 1953, at 8:00 P.M., while seated in his own home, he noticed sudden onset of severe pain in the upper right forearm. The pain spread to the entire forearm and to the hand, then the hand became numb and cold. At 10:00 P.M., examination revealed absence of radial and ulnar pulses. The brachial pulse was palpable to just above the antecubital fossa. There was hyperesthesia of the hand and lower forearm, paleness and coldness of the entire forearm and hand. The veins of the forearm were collapsed.

Embolectomy was carried out at 11:40 P.M. A large firm embolus was removed from the brachial artery, just above the bifurcation. After removal of the clot, there was free flow from the ulnar and radial arteries and from the brachial artery. The arteriotomy wound was closed with continuous suture of 5-0 arterial silk, after injecting 10 mgm. of heparin into the distal arterial tree. Postoperatively, the radial and ulnar pulses were of good quality. Recovery was uneventful.

The patient was well until January 31, 1955, when he awoke in the morning with numbness and tingling of the lower half of the right forearm. The patient felt for the radial pulse and none was palpable. He came to the hospital at once, where examination revealed no radial or ulnar pulse. Sensation, motion and color of the hand were normal. The middle and ring fingers remained cooler than the rest of the hand. He was given 25 mg. of priscolene intramuscularly and 75 mg. of heparin intravenously at 8:00 A.M. By 9:00 o'clock the radial pulse had returned, and the hand "felt normal." The clinical impression was embolism of the volar arch of the ulnar artery with associated vasospasm. A good recovery from this incident resulted, except excessive use of the hand brings out early fatigability of the middle and ring fingers.

In an attempt to avert further embolic episodes, the patient was admitted to the hospital April 14, 1955, for amputation of the left auricular appendage. At operation, the heart was found to be markedly enlarged, throughout all chambers, especially the ventricles. There was no mitral stenosis. Amputation of the auricular appendage was effected and the patient's postoperative course was uneventful. To this date, he has had no further embolic episodes.

Comment.—This patient serves to illustrate bo the surgical and non-surgical treatment of perip eral embolism. He further illustrates the fa that removal of the embolus at an early ti affords a better opportunity for the avoidance post-embolic ischemic symptoms than the no operative treatment. Even though the percenta of limb survival is high in patients with brach embolism, it is important to attempt to resto circulation to as near normal as possible, th avoiding the post-embolic ischemic sympto which may occur.

Case 2.—Mr. C. N., a white man, aged sixty-f years, with known auricular fibrillation, had onset pain, numbness, coldness and pallor of the right lo extremity at noon on September 10, 1955. When t seen at 8:00 P.M., the leg was cyanotic to the thigh, was cold, hypesthetic and there was no palpa femoral pulse. Auricular fibrillation was present. ploration of the right common iliac artery was carr out, and a large embolus was removed. Distal clo cm. in length was removed, but free flow of blood not obtained. Arteriotomy of the common fem artery was done, and a thrombus 37 cm. long removed. The tip of this thrombus was forked pointed, indicating that it had extended into the ante and posterior tibial arteries. The pointed ends of clot probably indicated that the thrombus had exten distally to this point only. Poor femoral pulsation sumed after closure of the arteriotomy, and the remained cold and cyanotic. Postoperatively, the pati t was given heparin for half an hour, then this interrupted by a blood transfusion and heparin s not again started until four hours later. Six ho s after the operation, the leg was of normal color temperative, but the distal half of the foot was c and somewhat cyanotic. Twelve hours after operati , the entire leg and foot appeared normal. No pu s were palpable in the foot, but the femoral pulse s palpable. The patient was discharged from the hosp l a week later with a warm, viable limb.

Comment.—This patient illustrates the chan s which occur when surgery is delayed as long twelve hours after the onset of symptoms. s operation was done almost twelve hours after e onset of the occlusion. Had he been opera d upon earlier, one would have been faced with s of a problem from distal thrombus. Another son is to be learned from this patient. The les n is that one must persevere in attempts to clear e arterial tree regardless of how impossible the situation may seem to be.

(Continued on Page 486)

Continuation Studies

YSPHAGIA

GRAHAM G. SMITH, M.D.
Minneapolis, Minnesota

Dysphagia is a symptom manifested by a great ny organic diseases and functional disorders. ysphagia is a general term used to denote some sturbance of the swallowing mechanism.

For purposes of maintaining some continuity thought regarding the causes of dysphagia, we ill first consider the upper swallowing mechanism nd then the lower swallowing mechanism.

In consideration of the upper swallowing mech-nism, brief reference should be made to the ree stages of swallowing, of which the second age, in which the bolus passes through the harynx into the upper end of the esophagus, is nost complicated and involved in the disturb-nces of the upper swallowing mechanism.

The muscles which take part in the propulsion f food through the pharynx are the muscles of e soft palate, the constrictors and elevators of e pharynx, and the muscles which close the pper aperture of the larynx. The powerful ction of this system of muscles propelling food hrough the pharynx is referred to by Negus[1] as he force-pump action. To complete the second tage of swallowing the powerful cricopharyngeus nuscle, which, during inspiration, maintains a onstant spasm to prevent air from entering the sophagus, now must relax in just the right time o admit the bolus of food into the upper esopha-gus.

In speaking of functional diseases of the upper wallowing mechanism we generally refer to three nain groups of disturbances: those due to changes n the action of the musculature, those due to nterference in the innervation, and those of pure-y psychogenic origin. The first group comprises hose diseases which cause changes in the action of the musculature without obvious local lesions or gross changes in its structure and includes: nyasthenia gravis, scleroderma, dermatomyositis, the myasthenia sometimes associated with tuberculosis or thyrotoxicosis, and the myasthenia associated with advanced senility.

The second group includes disturbances of both motor and sensory innervation. The motor nerve supply to the pharyngeal constrictors and the laryngeal muscles is the vagus. The tensors of the palate are supplied by the fifth nerve and the elevators by the vagus through the pharyngeal plexus. The sensory supply to the pharynx is from the glossopharyngeal and vagus nerves.

Motor disturbances usually produce weakness or paralysis but in some instances may cause spasm. The most common causes of paresis are:

1. Peripheral neuritis such as post-diphtheretic neuritis or that following other acute infections.
2. Jugular foramen syndrome due to lesions in region of the jugular foramen.
3. Lesions affecting nerves as they leave the bulb to enter the jugular foramen such as meningo-encephalitis, tumors, fractures.
4. Intra cranial lesions such as: hemorrhage, emboli, or tumors affecting the bulb, tabes dorsalis, poliomyelitis, disseminated sclerosis, syringomyelia and amyotrophic lateral sclerosis.
5. Osteoarthritis of the cervical spine or cervical spondylosis, a very important cause of the globus syndrome and one which is too often overlooked. Morrison[2] has emphasized the need for careful analysis of the "globus patient," including x-ray examination of the cervical spine, before dubbing him a neurotic. He pointed out that the gradual degeneration of the intervertebral disc elements eliminates the normal cushioning effect, resulting in opportunities for compression of the cervical nerves. The intercommunication and referral of afferent and efferent impulses between the cervical nerves and the V, IX, X, and XI cranial nerves is well established and

affords an understanding as to the cause of dysphagia in cervical spondylosis.

A tonic spasm of the pharyngeal musculature may occur in tetanus, certain brain injuries, botulism, and in acute local infections.

The occurrence of unexplained pain in the region of the cricoid cartilage which is relieved by swallowing is presumed to be due to spasm of the cricopharyngeus.

Psychogenic disturbances of the swallowing mechanisms, which constitute the third group of swallowing difficulties, are very common and apparently on the increase as the tension of modern living mounts. The usual complaints referable to the pharynx are pain, burning, dryness, choking, and sensation of a lump in the throat. Dysphagia of pyschogenic origin varies from mild forms of globus hystericus to more severe forms actually interfering with the passage of food and associated with true neurosis, hysteria, or even psychosis.

Foreign bodies lodged in the cricopharyngeal pinch cock will of course cause dysphagia until removed. Dysphagia may result from any local injury to the pharyngeal tissues such as might occur from laceration, chemical burns, fire, smoke, gases, and other similar agents. Likewise postoperative wounds in the region may cause temporary dysphagia. Occasionally postcricoid irritation is caused by a nasal feeding tube. Tumors of the palate, pharynx, and larynx will often cause dysphagia. Postcricoid carcinoma may be associated with dysphagia early or late in its course.

Pulsion diverticulum of the hypopharynx, which we see frequently, results in dysphagia or in some instances may be precipitated by dysphagia. This herniation of the sac occurs through the weakened triangular area posteriorly where there is a deficiency of muscle fibers due to the obliquity of the inferior constrictor muscles of the pharynx. The bulge occurs when there is a failure on the part of the cricopharyngeal constrictor to relax synchronously with the powerful force-pump action of the pharyngeal constrictors.

Dysphagia may develop as a result of a few conditions existing between the upper mechanism of swallowing and the lower or cardiac mecha nism. These conditions include foreign bodie esophageal carcinoma; certain benign tumors the esophagus such as neurofibroma and leiomy ma; extrinsic pressure due to mediastinal tumor bronchogenic carcinoma, heart disease, abberar blood vessels, and aortic aneurysm; and benig strictures.

In approaching the lower sphincter we embra a whole new group of disturbances causing dy phagia. Here again we see both functional ar organic diseases.

Cardiospasm or achalasia occurs at the low end of the esophagus, but its exact location, mec anism, and etiology are matters of considerab controversy. The theory, proposed by Hurst, th the spasm occurs as a result of atrophy of Aue bach's plexus seems most logical since the fun tion of this parasympathetic nerve plexus is cause muscle relaxation when stimulated.

Esophageal hiatal hernias of either the co genitally short esophagus or the sliding type m produce dysphagia from the regurgitant esopha tis resulting from the incompetency of the cardi Incompetence of the cardia may also result fro surgical procedures on the esophagus for ca diospasm or benign stricture. Aberrant gast mucosa with peptic ulceration has been found the lower esophagus. Ulceration of the esophag gastric junction following gastrectomy for pe tic ulcer or carcinoma will cause dysphagia.

The differential diagnosis of dysphagia invol a careful history taking, roentgenograms of t cervical spine, esophagrams, and esophagosco

Treatment may be medical, surgical, physi therapeutic, psychiatric, or a combination of th treatments, depending on the disease. Esoph geal dilatations have been very useful in t treatment of benign strictures, the globus sy drome, cardiospasm, and inoperable carcino The endoscopic application of the Mackler tu has been a useful palliative instrument for in erable esophageal carcinoma.

304 Doctors Bldg.
Minneapolis 2

ditorials

John F. Briggs, M.D.
Arthur H. Wells, M.D.
Henry G. Moehring, M.D.

SYCHOSOMATIC RESEARCH

Although the clinical psychologist is engaged in dividual research with psychosomatic problems, ie current trend is for him to function as a iember of a team which includes psychiatrists, s well as members of other specialties, such as iternists, surgeons, or gynecologists. When the inical psychologist is involved in a psychosoiatic problem individually, he is usually testing ell- formulated hypotheses by means of standard sychological techniques such as the Rorschach, ie Thematic Apperception Test (TAT), the innesota Multiphasic Personality Inventory MMPI), or rating scales of behavior. For exmple, in an attempt to study the specificity of eptic ulcer in relation to intense oral conflicts, se was made of two projective techniques, the orschach and the Blacky pictures. It was conluded that a conflict over oral-dependency needs lid not significantly differentiate a group of peptic ilcer patients from patients with nongastrontestinal psychosomatic disorders. In another ndividual study, an attempt was made to test he hypothesis that patients with essential hyperension show less aggression during stress than lo normotensive individuals. Using the TAT in i stressful manner and testing aggressivity by neans of the Allport Ascendance-Submission Study ind the Rosenzweig Picture-Frustration Study, two standard psychological techniques, it was found that the two groups did not differ in aggressivity. However, some behavioral differences were noted n overt aggression in that some normotensives refused to carry on with the task under stress.

Team studies of psychosomatic disorders have been common in recent years. For example, a study was made of personality patterns of children and adolescents with peptic ulcer syndrome. Although a psychiatrist and a psychologist were the principal investigators, internists and radiologists were also involved. A series of studies utilizing a team approach have come from the Memorial Center for Cancer and Allied Diseases dealing with the psychological impact of cancer and cancer surgery. Although the findings are too numerous to mention, the psychologist's contribution was that there was no consistent pattern on psychological tests in patients who have had a colostomy, dispelling the possible notion of a "colostomy personality." In still another team study on the relationship between personality factors and human cancer, it was found that the MMPI could readily detect cancer patients with rapidly advancing disease from similar cases in which the period of survival was far longer than the average expectancy. The results suggested the possibility that long-term and intense stress might exert an accelerating effect on the rate of growth of an established cancer.

Since psychosomatic medicine is such a multidiscipline problem, as demonstrated by the numerous research studies, it seems inevitable that treatment of the psychosomatic patient should also reflect the team approach rather than be attempted by any one specialty or discipline.

Murray S. Stopol, Ph.D.
Clinical Psychologist
Hamm Memorial Psychiatric Clinic

PHYSICIANS-HOSPITALS-PUBLIC

The medical profession is fortunate in that it can control public relations with but little effort and expense, by every doctor appointing himself a committee of one on public relations and sincerely and diligently applying himself to the task. Our daily contact with our patients who have faith in us offers the best opportunity. First of all by conducting ourselves, both professionally and morally above reproach, and occasionally adding a few tactful words for the good of the cause. It is very important that the office nurses and other assistants be instructed to be pleasant and cooperative and to use tact in their contact with the patients.

We can govern our own behavior and that of our office staff but not the personnel of the hospitals. Perhaps due to the shortage of beds and the constant demands on them for entry to the

---

Third in a series of editorials on psychosomatic research.

hospital, they have become so arrogant that they seem to enjoy heaping insults and abuses on everyone they contact. Recently a member of my family was hospitalized in Minneapolis. She has nothing but praise for the care she received,, but I have never before been subjected to such arrogance and disrespect as I received at the business office.

A short time ago I made the final payment on a hospital building fund, a year before this payment on the pledge was due. This was accompanied by a friendly letter in which I wished them success in their big venture. I did not receive a reply, not even a formal receipt.

My own experience is of no concern but, if a doctor who usually commands a little respect around the hospital receives this kind of treatment, there can be no question what kind of treatment is doled out to lay persons.

Our hospitals are so closely interwoven with the profession in the minds of our patients, both professionally and socially, that our patients think of us as a single unit.

We know that the hospitals have many difficult problems, but this does not excuse them for their anti-social attitude. If this treatment of the public by the hospitals continues, they will drag us down into socialized medicine no matter how hard we try to avert it.

F. H. Magney, M.D.

TELEVISION AND THE YOUNGSTERS

Juvenile delinquency, within the short space of three decades, has been blamed on everything from phases of the moon to broken homes—including moving pictures, comic books, prosperity, and poverty. If a youngster is doing poorly in school, or misbehaving generally, the easy answer is to pick out one cause and blame everything on it. Television is handy, and no one can deny youngsters are fascinated by this magic window on the world.

But the easy answer is rarely the complete answer. Intelligent parents must take into consideration the multiple influences affecting their children. It boils down to charting individual courses on a basis of deep affection, common sense, and faith.

From Mother Goose through Kon Tiki, youngsters of all ages have thrived on adventure yarns. Some of them are terrifying (or have you forgotten "Snow White" or "Little Red Ridin Hood"?). Television is aware of this interest i dramatic adventure stories, and answers the demand—with careful de-emphasis of the terrifying the violent, and the bigoted.

This is not to say there is no conflict in television dramas. A plot requires conflict, expresse on television as a visual clash between ideas o people. To remove this plot-conflict would lea ultimately to programming without viewer Furthermore, a gripping plot resolved with virtu triumphant—the rule on television—may very we serve to relieve repressed emotions of youn viewers. If a child is secure in his home relationships, there's considerable doubt a rip-snortin Western on television will send him off on destructive tangent.

No conscientious parent would permit his chi dren to subsist entirely on a diet of candy—n matter how loudly the youngsters might clam for it. Many thoughtful fathers and mothers fe similarly about television. They realize the children need plenty of sleep, exercise, and regula hours for eating. There is a definite place in th normal child's routine for reading, school wor and household chores. A little thought works ou a schedule which can include these, as well as selected television schedule.

What is TV's effect on children? A Minnesot State Medical Association committee reported i 1955 it could find no relation between delinquenc and the time children spend watching televisio Nor is the amount of time children spend watching TV, the committee continued, related t intelligence or to scholarship.

The television industry realizes its responsibiliti to its viewers—young and old. TV programmin is constantly examined and re-examined, to mak it better and more appealing not only to th children, but to every member of the family.

Gene Godt.
WCCO Radio and T

REHABILITATION IN PULMONARY TUBERCULOSIS—Its History

The first conception of the proper rehabilitati of the tuberculous came from Dr. Hermann Big of the United States in 1910, when he stated th

---

Second of a series of editorials on pulmonary tub culosis.

hat is needed is an industrial colony, where oper occupation can be provided under proper nditions, with proper living quarters, where rested' cases can earn a livelihood and main-n their health."

From this idea there originated two organiza-ns in the same year, 1915. One was the Altro orkshops of New York, the other the Cam-dgeshire Tuberculosis Colony founded by rrier-Jones in the village of Bourn, and moved er to Papworth. Neither followed the ideal of rmann Biggs in full detail. The Altro Work-ps interpreted "arrested cases" as sputum-gative cases with minimal extent of lung dam-e, and while it provided sheltered employment did not supply living quarters. Varrier-Jones ovided both work and homes, and he admitted n in all stages of disease. He did not confine nself to the non-infectious, and preached the n heretical idea that the rightful place of the erculous bread-winner was to live with his mily in a house where he would have a room himself, which he would use continually if he mained sputum-positive, or occupy at any time had an intercurrent illness or a frank re-acerbation of his disease.

On both sides of the Atlantic these ventures ıst have caused considerable surprise; certainly th met with little help at first, and sometimes th active opposition. After all, it was only four ars previously that the National Insurance Act Great Britain had made sanatorium treatment, en hailed as the long-sought cure, available to all fferers from pulmonary tuberculosis; and it was t until four years later, in 1919, that Dr. Noel rdswell published the first disturbing statistics m King Edward VII Sanatorium, Midhurst, on ortality following such treatment.

But Varrier-Jones had already seen that some-ing more was necessary than a temporary regi-n of rest and graduated exercise, with good od, in hygienic surroundings. He was convinced at these temporary conditions should, for most ses in those days, be made permanent, and time oved his thesis correct as against the answers of her workers to the new problems raised by rdswell's report. He did not condemn sanato-m treatment, because he saw in it a regime with good middle but poor supporting ends; he real-d that at one end eighty per cent of admis-ns were already beyond the early stages of sease, while at the other end, the sanatorium was powerless to see the implementation of the advice it gave to the patient on his discharge. He therefore built round the sanatorium as an essential section of his settlement; from it his patients were to proceed to work and to colonization, and to it they could return if further treatment proved necessary.

Any practical interest in the extension of proper services for the tuberculous has sprung from these two sources, although little more was done before the end of World War II.

R. R. Trail, M.D.
London, England

THE SYMPTOMS OF ALCOHOLISM

The range of I.Q. scores for alcoholics is the same as for non-alcoholics.

The alcoholic tends to be suspicious and sensitive, unable to tolerate pressure. He is worried, anxious, very easily depressed, and is likely to change jobs often. Another characteristic of the mature alcoholic is social isolation. He thinks that no one understands him, especially those who are close to him. He generally has very few real friends.

The alcoholic's motive for drinking is to escape the reality of life and to create a world of fantasy—unreality. He finds himself drunk regularly. He needs that morning drink to get organized.

Going on "benders" usually marks the beginning of the chronic phase. A "bender" is a period of a day or more in which a person drinks blindly, helplessly, with just one purpose—to get drunk.

Possible impairment of his character and personality traits may occur, as for instance:

Initiative—Loss of ability to start new activities.

Trustworthiness—Loss of confidence in one's sense of responsibility in work and social relationships.

Personal appearance—Resulting in poor grooming and slovenliness in dress.

Perception and memory disappear as restraint and self-control are lessened.

The field of observation is narrowed, muscular co-ordination is weakened, and clumsiness takes the place of precision, often resulting in mishaps.

Alcohol does not cause organic damage of any cells in the brain or the rest of the body; it affects only the functions of the cells as they are controlled by the central nervous system.

Fifth in a series of editorials on alcoholism.

The alcoholic is sick, for excessive use of alcohol may bring about personality deterioration and mental defects, loss of physical vigor, and nutritional deficiency.

PAUL S. RAHNEFF
Executive Secretary
Citizens' Commission on Alcoholism of Minnesota, Inc.

THE HISTORY OF GLASS CONTAINERS

Not only was the Jamestown glass plant *America's first factory,* and *America's first industry* —existing as it did a dozen years before the arrival of the Pilgrims at Plymouth in 1620—but glass was part of the first cargo ever exported from these shores.

In his "Historie of Virginia," Captain Smith wrote: "We sent home ample proof of pitch, tar, glass . . . " Fragments of glass found among the ruins indicate that bottles, vials and drinking glasses were produced at the Jamestown plant and exported to England, and it is probable that glass beads given Indians in exchange for land were produced at America's first factory.

After Captain Smith left for London in the fall of 1609, sickness, hunger and death struck the Jamestown colony in full force. Work at the glass plant first slowed down, and then stopped altogether. Twelve years later—in 1622—a Captain William Norton arrived in Jamestown with a group of Italian glassmakers, and operations were resumed. The fires of the Jamestown plant died out permanently, however, in 1624.

In 1632, two Salem, Massachusetts, colonists started a plant to make glass bottles to transport New England rum and cider to the Carolinas and the West Indies. This venture was more successful than the original Jamestown plant, continuing until 1670. And glass plants were also operating in New York and Pennsylvania during the latter half of the 17th century.

One of the most successful of America's early glass factories was founded in 1739 in Salem County in southern New Jersey, by German born Caspar Wistar, one of the great glassmakers of all time. At first, Wistar made bottles which he sold to traders who were smuggling West Indian molasses into the Colonies in violation of British regulations. Later, Wistar and his son also produce bowls, drinking glasses, preserve jars and dishes.

The Wistars are credited with making America first flint glass, the remarkably clear and brillia glass which was perfected in England by Geor Ravenscroft in 1675. And they produced, as we magnificent colored glass. Shades included beau ful greens ranging from aquamarine to deep e erald, and ambers from dark brown to yellow a honey. Martha Washington owned a tiny Wist scent bottle of yellow and turquoise—and probab followed the then-current fashion of carrying tucked inside her glove.

By the time the Wistar plant closed in 17 after more than forty successful years, anoth great glassmaker—William Henry Stigel, h come and gone. Called "Baron" because of h flamboyant habits, Stigel operated in Lancast County west of Philadelphia. Stigel's ambiti was to prove that beautiful glassware could produced here as well as in Europe, and prove he did.

England had recently passed new tax la British glass, along with tea and other Brit products, now cost the colonists dearly in imp duty. These duties, Stigel concluded, were f reason for expanding and perfecting glassmaki in America. Money—even if it had to be b rowed—was no deterrent, and the result was gla ware highly prized today by museums and c lectors everywhere.

The flamboyant "Baron's" enthusiasms w more than his deficit financing could suppo however, and, in 1774, Stigel landed in debto prison.

JOHN M. FOSTER
Foster-Forbes Glass

PHONOCARDIOGRAPHY: A LOST OPPORTUNITY

The role and clinical applications of phono diography are still controversial. Unfortunat many of those who oppose a systematic use of method know little about it or have an incomp knowledge of the physical principles involved.

Auscultation and phonocardiography are inseparable approaches to the study of the s clinical phenomena. However, phonocardiogra has a wider scope because it can be used eit for confirmation of clinical auscultation or a

---

Third in a series of editorials on glass and glass containers.

iore perfect method of study of the sounds and iurmurs.

The human auditory system is highly imper-ct. Its characteristics render it far better able evaluate the high-pitched notes of a musical istrument than the lower pitched notes of the eart. Easy fatigability, sensitivity which is poor r low notes and then sharply increases on a log-rithmic scale, inability to separate vibrations, dif-culty in timing certain sounds, conspire to render uscultation a difficult art. Unfortunately, even ie best "artists" cannot surmount certain physical nd physiological limitations and frequently give ntrasting opinions.

Technique.—Phonocardiography is now based i electric recording and electronic amplification, igh film speed, and use of other simultaneous acings (ECG, jugular tracing, low frequency acing of the precordium) for timing certain aves.

A quiet room, a reliable microphone, a correctly laced chest piece, and a rubber strap to hold the iicrophone, are necessary. Exclusion of extra-eous noises is secured (auscultatory control!) and he respiratory noises are avoided by inducing pnea.

Many of the currently presented tracings reveal nproper technique, low film speed, or an obsolete nethod which does not allow for correct selection nd amplification of the important sounds and nurmurs.

Recent Developments.—Among the contribu-ions of recent years, the following should be kept n mind:

1. Separation of various bands of vibrations by lifferent filters (Mannheimer, 1939).

2. Description of stethoscopic phonocardiog-aphy (Rappaport and Sprague, 1941). This nethod allows for correct reproduction of sounds nd murmurs, including vibrations at the lower imits of audibility (infra-sounds). The tracing ives an excellent reproduction of gallop sounds, naps, and rough murmurs.

3. Description of logarithmic phonocardiog-aphy (Rappaport and Sprague, 1942). This nethod gives a fair correlation between sound racings and auscultation. It also permits a fair eproduction of high-pitched sounds and murmurs.

4. Electric calibration of sounds and murmurs (Wells, Rappaport and Sprague, 1949) which supplies a rough comparison between tracings.

5. Clinical calibration of sounds and murmurs (Luisada and Gamma, 1955) permitting a more accurate comparison between tracings.

6. Selective phonocardiography (Richmond, Aravanis and Luisada, 1956). This new method has been developed for reproduction of either low-pitched murmurs, like that of mitral stenosis (first filter: emphasis on vibrations in the bands 60-110 per sec.) or high-pitched, soft murmurs, like that of aortic insufficiency (second filter: emphasis on vibrations in the bands 150-200).

Phonocardiography is not widely used because it requires special training and, except in special cases, personal study by a physician. This deprives many complex cardiac cases of one important aid in the workout of their diagnostic problems.

Phonocardiography is extremely useful for the study of patients with rheumatic valvular defects or myocardial damage, particularly for those cases where a differential diagnosis between the two groups is necessary. It has already given interesting data in congenital lesions. It correctly reveals phase, "shape," and pitch of murmurs; phase, nature, and shape of snaps, clicks, and gallop sounds. In addition, phonocardiography is the best method for timing the waves of certain tracings (ballistocardiogram, electrokymogram, intracardiac pressure tracings). An electrocardiogram is only a poor substitute for it because of variable relationships between electric and mechanical phenomena and poor definition of the end of systole.

A. A. Luisada, M.D.

SAFEKEEPING

Most large banks maintain Safekeeping Departments. Such a department can be of valuable service to you because it offers protection and safety for your stocks and bonds on a readily accessible basis, subject to your instructions. Placing your securities in safekeeping is very simple. You merely bring them to your bank's Safekeeping Department where you will be given a receipt for your securities. The department staff will prepare the necessary records, files and cross files, and will put your securities in its cash vault.

Safety and *convenience* are but two advantages in having your securities in a bank's own vault.

The Safekeeping Department staff will be glad to clip coupons from your bonds as they become due and deliver them to the bank's Collection Department. This department can collect the coupons for you and either credit your account or send you a check for the proceeds. Similarly, if a bond becomes due, the bank can collect it for you, and either send you a check or credit your account with the funds. Stock dividend checks can also be sent by the respective companies to your bank for your credit. Such servicing of your securities while they are in safekeeping at your bank will be a genuine convenience for you.

Your securities, of course, are *available* to you any time you want them. It's as easy to take them out of the bank as it is to deposit them. Simply surrender your safekeeping receipt, sign a release, and in a few minutes the securities will be transferred from the bank's vault into your hands.

Whether you are in or out of town, your securities are available to you at all times, for they are always subject to your instructions which will be immediately carried out. If you should be out of town for several months, perhaps engaging in research, studying abroad, or enjoying an extended vacation, you need have no concern for your securities if they're in safekeeping at your bank. Should you wish to dispose of some—or sell or trade them—all you have to do is to notify the bank what your wishes are, and they will follow your orders.

The nominal charge made for a bank's safekeeping service is most moderate for the satisfaction you will have in knowing your securities are safe, serviced, subject to your instructions, and always immediately available to you.

John L. Sankovitz
Manager, Safekeeping Department
First National Bank of Saint Paul

PERIPHERAL ARTERIAL EMBOLISM

(Continued from Page 478)

Conclusions

The operative treatment of arterial emboli ge erally leads to better results than the non-operati treatment. Early surgical intervention is the mo important single factor in the operative treatmen General heparinization is an important adjun treatment in those cases in which it is felt th serious bleeding will not result from hepariniz tion.

Summary

The treatment of arterial emboli is reviewe Discussion of the various modes of therapy undertaken with the author's recommendations to specific details of therapy.

Bibliography

1. Labey, Quoted by Key, E.: Embolectomy in treatment of circulatory disturbances of the tremities. Surg. Gynec. & Obst., 36:309-316, 19
2. Denk, W.: Zur Behandlung der Arteriellen E bolic. Munchen. med. Wchschr., 81:437-439, 19
3. Leriche. R. and Fontaine, R.: Technique de l' filtration novocainique du sympathique, ses indi tions, ses resultats. Presse. Med., 42:1843, 19 Jaques, L. B.; Perrett, T. S.
4. White, J. C.: Diagnostic novocaine block of sensory and sympathetic nerves. Am. Surg., 9:2 274, 1930.
5. Murray, D. W. G., and Best, C. H.: Heparin a vascular occlusion. Canad. M. A. J., 35:621 1936.
6. Haimovici, H.: Peripheral arterial embolism. An ology, 1:20-45, 1950.
7. Warren, R.; Linton, R. R., and Scannell, J. Am. Surg., 140:311, 1954.
8. Haimovici, H.: Les Embolis Arterielles des Me bres. pp. 146, Paris: Mason and Cie, 1937.
9. Warren. R. and Linton, R. R.: The treatm of arterial embolism. New Eng., J. Med., 238:4 1948.

HORMONES FOR SHOCK

When all other measures fail, treatment with adrenal hormones may prove life-saving in some cases of shock following acute coronary thrombosis, according to Dr. Benjamin Manchester of Washington, D. C.

The cardiologist told of six patients in whom a state of shock had persisted for several days without responding to standard treatment. Laboratory tests showed that the adrenal glands were not functioning adequately.

Dr. Manchester recalled that similar observations-depressed adrenal function—had been made in a stress due to other organic diseases, and that reco had occurred when appropriate adrenal therapy was u to overcome this deficiency.—B. Manchester, 7 *Medical Way*, 18:6 (Mar.) 1956.

Medical Economics

Edited by the
Committee on Medical Economics,
Minnesota State Medical Association
George Earl, M.D., Chairman

RESULTS OF PHYSICIANS' SOCIAL SECURITY POLL ANNOUNCED

On May 8, 1956, a letter, accompanied by a ost-card ballot, was sent to all members of the innesota State Medical Association requesting eir opinions on social security coverage for embers of their profession. The doctors were ked whether they favored compulsory, volun- ry or no coverage under social security.

A total of 3,366 letters was sent out. By May , the response totaled 1,908 (nearly 58 per nt).

A report dated May 16 and submitted to the ouse of Delegates at the 103rd annual meeting Rochester reported that 233 (12 per cent) of e doctors who responded favored compulsory verage; 1,155 (61 per cent) favored voluntary verage and 530 (27 per cent) opposed any type social security coverage.

Responses from the metropolitan areas of Du- th, St. Paul and Minneapolis totaled 917; 779 me from small towns and 212 from Rochester. ne hundred seven city doctors favored compul- ry coverage compared to eighty-four in smaller wns and thirty-two in Rochester.

City doctors preferring voluntary coverage to- led 580 with 435 in smaller towns and 140 in ochester agreeing.

Opposition to any form of social security cover- e for their profession came from 230 doctors in etropolitan areas; 260 in smaller towns and forty Rochester.

The age brackets broke down this way: A total 343 doctors under thirty-five responded to the ll; 530, from thirty-five to forty-four; 469, from rty-five to fifty-four, 300, from fifty-five to sixty- ur and 266 over sixty-five years of age.

Sixteen doctors under thirty-five favor compul- ry coverage while 225 in the same age bracket ose voluntary coverage and 102 are opposed to y social security coverage.

Fifty-nine physicians between ages thirty-five d forty-four want compulsory coverage; 316 efer voluntary coverage and 155 disapprove of y social security coverage for physicians.

Compulsory coverage is favored by sixty-six doctors from ages forty-five to fifty-four; 309 in the same age bracket favor voluntary coverage and ninety-four want none.

In the fifty-five to sixty-four age group, forty-six favor compulsory coverage; 172 prefer voluntary and eighty-two are opposed to any social security coverage for physicians.

Thirty-six doctors over sixty-five want compulsory social security coverage while 133 in the same age bracket prefer voluntary and ninety-seven want none.

Since this report was prepared, an additional 319 cards have been received indicating the same strong preference for voluntary coverage. These additional replies bring the total response to the poll to over 65 per cent, a larger percentage of replies than in the majority of other states conducting similar polls. This is a credit to the physicians of Minnesota—to the interest and co-operation demonstrated by this prompt and unusually large response.

HOUSE OF DELEGATES PASSES SERIES OF IMPORTANT RECOMMENDATIONS

The 1956 House of Delegates of the Minnesota State Medical Association passed several vital recommendations during its annual session in Rochester. Briefly, several of these measures were:

1. *A recommendation* officially requesting Blue Shield to change its corporate structure to include all participating doctors who wish to do so, to become members of the corporation. The change was recommended by the Council on petition of the St. Louis County Medical Society. Blue Shield now has only twenty-one corporate members who elect a board of eleven members.

This House action is in no way binding on Blue Shield. No action was taken on proposals that Blue Shield extend its coverage to office calls although the St. Paul Society of Internal Medicine has gone on record opposing such extensions.

2. *Approval of a resolution* calling for the establishment of a medical examiner system to supplement, not to replace, the present coroner system in Minnesota. A medical committee is to work with a Minnesota

State Bar Association committee to prepare a bill for introduction in the 1956 legislature.

3. *Adoption of a resolution* opposing the practice of medicine by corporations in Minnesota. This resolution emphasizes the fact that this applies to non-profit as well as to profit-making corporations.

SENATE COMMITTEE ACTS ON H.R. 7225

On May 25, the Senate Finance Committee forwarded the social security bill (H.R. 7225) to the Senate floor. The committee reported the bill without the major provisions in the House-passed version. Cash disability benefits were rejected; tax increases were also rejected. The retirement age for women was lowered to sixty-two for widows only.

The bill went to the Senate with no further amendment except the extension of the 1952 McFarland amendment which increases the proportion of public assistance payments paid by the government. Medical payments as a separate category under public assistance with the states getting up to $4 of U. S. money per month for adults and $2 for children have been incorporated into the social security bill. Funds would have to be matched 50-50 by the states.

MILITARY DEPENDENT MEDICAL CARE BILL PASSES BOTH HOUSES

The new military dependent medical care program sets up the financial machinery for furnishing private medical care to hundreds of thousands of wives and children of servicemen. This plan makes medical care a statutory right, defines dependents and provides uniform benefits for Army, Navy, Air Force, Marine Corps, Coast Guard and Commissioned Corps of Coast and Geodetic Survey and U. S. Public Health Service. This protection for dependents is designed to make military careers more attractive and to help reduce personnel turnover.

WHO ASSEMBLY REINSTATES RUSSIA; REDUCES HER BILL

Under terms of a compromise resolution, Russia and eight satellite countries can resume active membership in the World Health Organization by the settlement of their over-due assessments. The ninth World Health Assembly meeting in Geneva voted 51 to 0 (with five abstentions) to restore the rights and obligations of active membership provided contributions are paid in full for the years when these members participated actively in the work of WHO and five per cent of the amount assessed during inactive years. Complete payment is due within ten years.

ARE DOCTORS REALLY OVERPAID

A recent article in "The Medical Way" reports on a comparison made between the earnings of a typical doctor and a representative bricklayer over a period of twenty years. After a two-year apprenticeship and a period of being a journeyman the bricklayer's total income for his first ten professional years is about $66,976.

A typical doctor's income for his first ten dedicated years is $5,000—none from his eight years in college and medical school and $2500 for each year of his residency. If he begins practice in a prosperous American community at the end of his residency he can expect to average earnings estimated today at $15,000 per year for the next ten years.

At the end of twenty years in *his* profession, the bricklayer has earned a total of nearly $140,000; the doctor, $155,000. However, if the bricklayer worked the average doctor's 56-hour week, he would earn an annual salary of over $12,000 a fraction less than a doctor's for the same number of hours of work.

"However," states the article, "the purpose of this comparison is not to stir up an argument over the bricklayer's pay. He is a skilled and respected artisan and is certainly entitled to whatever he earns."

MINNESOTAN RECEIVES APPOINTMENT

Dr. Robert N. Barr, secretary and executive officer of the Minnesota Board of Health, is a nine-member advisory committee to aid in improving and extending medical care and general health services to American Indians.

WMA ACTS AS INTERNATIONAL VOICE OF ORGANIZED MEDICINE

The World Medical Association has become a strong factor in protecting and promoting the professional interests of the medical profession and the cause of world peace. Now in its [illegible] year, WMA is a federation of the most representative national medical associations in fifty-two untries. The AMA is a leading member. Every dividual physician in the U.S.A. is eligible for mbership in the United States Committee. An- al membership dues are $10.00.

REIGN MEDICAL SCHOOL GRADUATES TO BE EVALUATED

At a recent meeting, the AMA Board of Trus- s approved a long-sought program for evaluat- foreign medical school graduates. The pro- sed program is designed to clear up two im- rtant facts regarding each foreign medical aduate who wishes to come to the United States an intern or resident or in any other position at involves medical care of the American public:

1. The medical credentials of a foreign-trained physician must clearly indicate that he was graduated from a bona-fide medical school and
2. By examination, a foreign medical graduate must demonstrate that he has medical knowledge equivalent to that demanded of graduates of schools in the United States.

More than 6,000 foreign physicians are in the nited States this year to complete their profes- onal training as interns or residents. They come om eighty-four different countries and are lo- ated in all states except Idaho, Nevada, New exico and Wyoming.

AMA CLOSES PRINTING PLANT

June 30 marked the end of an era in American edical Association history. That was the date he last copy of *The Journal AMA* was published the Association's own printing plant. In its early seventy years of operation, the shop printed nough journals to circle the equator twice if hey were laid end to end.

Beginning July 1, *The Journal* will be printed y the McCall Corporation, Dayton, Ohio, which as printed *Today's Health,* the AMA's popular ealth magazine, since 1950.

DMINISTRATION SPONSORS LEGISLATION FOR MENTAL HEALTH STUDY

The administration has sponsored legislation to uthorize the Public Health Service to make special project grants for the support of investigations, experiments and demonstrations in the field of mental health with particular emphasis on projects designed to improve the operation and administration of state institutions for the care or treatment of the mentally ill. The Department of HEW will request $1,500,000 this year for such grants if Congress approves this legislation.

VA TO INVESTIGATE VALUE OF "TRANQUILIZING" DRUGS

The Veterans Administration is launching a large-scale research project to investigate the value and usage of the new tranquilizing drugs for mental illness. The resources of the National Research Council will be used in planning and executing the project.

PHYSICIANS TO BE DRAFTED FOR NAVY DUTY

The selective service headquarters this month is filling a Defense Department requisition for 380 physicians for Navy duty. Data indicate that the order can be filled without tapping any doctors in Priority III past age thirty. Neither the Army nor the Air Force is expected to call for any physicians before the last quarter of 1956. Commissioning of a large crop of interns in July will help meet replacement requirements.

DOCTORS TOP EARNERS AMONG PROFESSIONS IN CANADA

In Canada where income statistics are released periodically by the Department of National Revenue, physicians top the most recent list among the professions. Their average annual income is reported to be $11,258. Close behind them were consulting engineers and architects with average incomes of $10,289.

Mortality is not the real yardstick to measure the importance or judge the control of a disease. Even if there were drugs capable of preventing the sudden deaths resulting from hypertension and arteriosclerosis, these conditions would remain a tremendous medical and social problem. Similarly, adults do not commonly die of mental disorders, arthritis, or peptic ulcers. Yet, no one would claim that these afflictions have been conquered. Neither has tuberculosis been conquered. Instead, the forces which have been at work during the past century have slowly converted it from a killing to a chronic disease.—Rene J. Dubos, Ph.D., National Tuberculosis Association Transactions, May, 1954.

President's Letter

THE GOLDEN AGE OF MEDICINE

EDITOR'S NOTE: The following message is an excerpt from an address Dr. Wilson delivered at the annual banquet of the Minnesota State Medical Association May 22, 1956, in Rochester. Its theme was so well-chosen and well-received that we felt it deserved repeating.

You and I have had the privilege of living in a wonderful generation, a period of scientific discovery and progress such as the world has never known and, one is tempted to say, such as the world will never know again.

Medicine, as we know it, has also had its golden age in the last half century. I knew the medicine of 50 years ago because I was brought up in a doctor's family. My father grew up as a farm boy, started a sort of "hang-around" apprenticeship with a nearby country doctor and later went to medical school in Chicago for about one year. He then returned home to start practicing medicine.

On the day that I was born, April 30, 1895, his total business was $1.00, and that was charged.

Those were the days of bromidia for the nerves, calomel for the bowels, tincture or infusion of digitalis for the heart, creosote and heroin for the cough and morphine for pneumonia. Those were the days when people died of inflammation of the bowels instead of living with appendectomies. Those were the days when a woman stayed in retirement when she was pregnant. Those were the days when doctors diagnosed diphtheria by the smell. There were no x-rays; fractures were diagnosed and reduced by touch and you bought your spectacles from the grocery store.

Now let us consider in contrast what progress has been made in the past half century.

In the field of public health, for example, we have the protection of the Pure Food and Drug Act passed fifty years ago; everyone in Minnesota drinks Grade-A pasteurized milk, and I am proud to say that my home city of Winona was the first in the country, to my knowledge, to pass an ordinance requiring pasteurization of all milk sold in the city. We have strict standards for municipal water supplies;

we have public health nursing in most counties, cities and schools. And I cannot leave public health without paying a well-deserved tribute to our late beloved Dr. Chesley, a man with an outstanding national reputation in his field.

To go on to other fields: Can you imagine trying to practice medicine today without the diagnostic x-ray, the chest studies, the gall bladder, kidney, stomach and colon studies? Then, too, we have blood typing and cross-matching for safe transfusions; we have the Wangensteen suction for postoperative ileus and small bowel obstruction; we have the modern treatment of pulmonary tuberculosis with the new drugs and improved surgery.

We have modern laboratory procedures, blood chemistries, electrolytes and fluid balance. My father never heard of such things.

During the past half century radical changes have also taken place in medical education. The quack schools and diploma mills have gone out of existence. Continuation courses and post-graduate opportunities have multiplied until no man lacks unlimited opportunities to keep in step.

It has been a golden age of medicine, and progress is continuing at such a terrific pace that I am sure it is taxing the mental capacities of all of us to keep up with it.

I am reminded of a lovely lady of ninety-three years who sustained a fracture of the hip some twenty years ago. While convalescing in the hospital, she did a lot of reading. She would start daily with her Bible, then the morning paper and a good book and so on. She developed some eye strain, and I cautioned her about reading too much. She eased off a bit but again in a week or two she had developed quite a conjunctivitis, and I became firmer with her and told her she must ease up on her reading or I would be forced to take all the reading material from her room.

At ninety-three she looked up at me with a little twinkle in her inflamed eyes and said, 'But, Doctor, I don't want to grow up ignorant.'

Yes, with this golden age for our profession, we'll have to continue to read and read until our eyes fatigue, if we too are not to grow up ignorant.

R. H. Wilson

President, Minnesota State Medical Association

History of Medicine in Minnesota

THE MEDICAL HISTORY OF RICE COUNTY

(1855-1901)

ADOLPH M. HANSON, M.D.
Faribault, Minnesota

(Continued from April issue)

Poehler, Franklin T.—He graduated from the College of Medicine and Surgery of the University of Minnesota in 1896 and was licensed in the same year. He was practicing in Morristown in 1898. He occupied an office in Minneapolis (410 Syndicate Arcade) in 1900 and continued to practice in Minneapolis for many years. He was a member of the Hennepin County Medical Society and the Minnesota State Medical Association.

Pringle, Alexander F.—He graduated from the Medical Department of McGill University at Montreal in 1880. There was a Dr. Pringle, well-known as an eye, ear, nose and throat specialist, long established at Northfield, when the writer came to Faribault in the summer of 1912. He is listed as being in Northfield as early as in 1886. He was licensed on March 10, 1885.

Ricker, George E. (Edwin).—A graduate homeopath, Hahnemann Medical College, Philadelphia, in 1878. He was practicing in Northfield in 1886. He had been licensed November 26, 1883. From 1890 through 1905 he is listed in Minneapolis and in 1909 in Washington, D. C.

Roberts, Thomas W.—Practiced in Faribault between 1886 and 1894 as the successor of Dr. Courtland B. Rockwell with an office at the corner of Main Street and 8th Avenue. He had graduated from the Hahnemann Medical College and Hospital, Chicago, in 1884 and was licensed in Minnesota April 15, 1887. It seems he had practiced for many years in Winona County where he appeared as early as 1866, before he graduated from the medical school.† There is some confusion as to the places where he practiced. Directories list him at Winona from 1890 through 1898. When he left Faribault in 1894 he supposedly moved to St. Paul, though medical directories list him there from 1903 to 1909.

Robilliard, Walter Henry.—He was born at Racine, Wisconsin, on June 20, 1861. He was a graduate of the public schools of Racine and of Lawrence College, Appleton, Wisconsin. In 1884, he graduated from Hahnemann Medical College, Chicago. He started practice at Port Huron, Michigan, in 1885. He removed to Belleville, Michigan, and from there to Liscomb, Iowa. At Liscomb he was married to Miss Eudora Joette Hauser. Three children were born to this union: Charles Morton, Harold Shaw, and Nellie. His eldest son, Dr. Charles Morton Robilliard ("Doctor Charlie"), is still in active practice in Faribault at the age of sixty-six (December, 1954). Dr. Walter Henry Robilliard was physician to the Minnesota State School for the Deaf for thirty-five years where he was respected and loved.

---

†See "Medical History in Winona County," Minnesota Medicine, p. 581, August, 1940.

He was Faribault's Health Officer for some years. He was prominent in civic affairs, those of the Rice County Medical Society and the St. Lucas Hospital Staff, and in Masonic circles.

He was a fiery and very positive individual who loved an argument at our Rice County Medical Society's meetings, following adjournments, with Martin L. Mayland, W. H. Rumpf, and Patrick A. Smith, F. S. Warren, and F. R. Huxley. The always unruffled Huxley was invariably the one to pour oil on the troubled waters, which were never more than tempests in a teapot, actually. The writer, for one, would not have missed one of those stormy sessions, which were a mutual friendly agreement to disagree about something, or other, to liven us all up with the recountals of mistakes in diagnosis and the loss of a patient to one of his competitors in the old days as a consequence, et cetera. Dr. Walter Henry Robilliard died in the crisis of a lobar pneumonia on November 1, 1931.

Rockwell, Courtland B.—Graduate of the Homeopathic Medical College of Chicago in 1883. He was licensed to practice in Minnesota on December 31, 1883 and practiced at Faribault for three years (he is listed there in 1890). From 1895 through 1909 he is listed in Chicago. His practice in Faribault was taken over by Dr. Thomas W. Roberts.

Rogers, Arthur C.—Born at Decorah, Iowa, on July 17, 1856; died at Faribault, Minnesota, on January 2, 1917. He received his early education in the public schools of Ohio, the Raisin Valley Seminary near Adrian, Michigan, and Barlham College, Richmond, Indiana, from which he graduated with the degree of B.S. in 1877. (This same College conferred the honorary degree of LL.D upon him in June of 1905). He graduated from the Medical School of the University of Iowa in 1883. He was clerk and physician of the Government Training School for Indians at Chemawa, Oregon, in the latter part of 1883 and the early part of 1884. While there he received his appointment as Superintendent of the State School for Feeble-Minded at Faribault, Minnesota. He entered upon these duties on August 20, 1885. He was president of the Rice County Medical Society in the years 1909 and 1910 (serving two consecutive terms).

On July 17, 1882, he was married to Miss Phoebe Coffin, daughter of Mr. and Mrs. Walter Coffin of Fort Dodge, Kansas.

His parents were Ansel and Cynthia (Benedict) Rogers, who went West and settled in Iowa in 1852. His father was a miller and a Society-of-Friends clergyman. The mother of Dr. Rogers died near Ashley, Ohio, in 1863; his father in Richmond, Indiana, in 1873.

His obituary, which appeared in the *Journal of Psycho-Asthenics,* Vol. 21, Nos. 3 and 4 (March and June, 1917), reads:

> "ARTHUR C. ROGERS, M.D., LL.D., superintendent of the Minnesota School for the Feeble-Minded and Colony for Epileptics almost since its founding, and editor of the *Journal of Psycho-Asthenics* from its beginning in 1896, died January 2, 1917. . . . To the service of its editor, to whose efforts alone its existence was mostly due for many years, is due in a large measure whatever progress has been made in America, as well as the much-widened popular and scientific interest in the feeble-minded today."

This short and terse obituary says it all in a few words, but it will fail to do him full justice with the hurried or casual reader. Dr. Arthur C. Rogers was a leader and a real authority in his chosen field, not only in Minnesota and the Western Hemisphere, but in the World. He had the true Research Spirit and wrote considerably on the subjects of feeble-mindedness, e.g., a nine-page article on feeble-mindedness and criminality (1911). In his short work, entitled "Dwellers in the Vale of Siddim—A True Story of the Social Aspect of Feeble-mindedness,"‡ he follows one single feeble-minded family down through many generations; it reveals the many criminals and the huge sums in dollars, alone, this family cost the country (all the various States through which he traced them—a research that covered many years on his part). It is well-nigh unbelievable. If Dr. Arthur C. Rogers had not accomplished anything else worthwhile in his lifetime, this work, alone, would justify his having lived.

Rose, Francis M.—"A member of the firm of Rose & Wood, the leading physicians in this part of the state, was born in Columbus, Ohio, on March 25, 1841. Mr. Rose's grandfather visited the present site of that city in 1790, and located on a farm twelve miles south of there, where he died. Francis' father was a merchant in the same place, and remained there until his death. Dr. Rose attended the schools of his native place and the State University two years, commenced the study of medicine when sixteen years old at Starling Medical College and graduated three years later (1860). He practiced at West Rushville, Ohio, until 1861, when he was appointed Assistant Surgeon of the Forty-third Ohio Regiment; in April, 1862, was promoted to Regimental Surgeon, and in the fall to Division Surgeon, being then only twenty-one years old. In 1863, he was Medical Inspector of the Seventeenth Army Corps, on the staff of General Frank Blair; in 1864, was Inspector of General M. F. Forath's division, and remained until the close of the war. He then located in Ottawa, Illinois, and in 1868, removed to Faribault, forming the present partnership in 1874. On the 25th of November, 1876, Miss Cornelia W. Whipple became his wife. They have one child, Francis M." *(History of Rice County* by Rev. Edward D. Neill, 1882).

Dr. Rose was physician of St. Mary's Hall and the State School for the Blind.

Schmidt, Andrew J.—Practiced for a short time in Northfield for a few years. He is listed there from 1895 to 1898. Dr. Schmidt was a graduate of McGill University in 1886 and was licensed in Minnesota December 20, 1886. He died in November, 1902.

Scofield, John L.—The first physician to practice in Northfield, Dr. Scofield's biography appears out of alphabetic order, as the second in this series (Page 56, January, 1956 number).

Scott, M. W.—Practiced for a short time in Rice County. He had practiced in Morristown until 1870 and then located for one year in New Ulm. His fees were 25 cents in town, 50 cents in the country.§ He is probably identical with **Dr. Milo Wakely Scott** who graduated from Rush Medical College, Chicago, in 1877 and was licensed in Minnesota by exemption. He claimed that he had been in practice in Minnesota since 1868. During the 1880's he moved to Grand Forks where he is listed in the medical directories from 1886 through 1896. He was county physician and coroner and was a member of the first Capitol Commission which located the State Capitol at Bismarck. During the first years after the turn of the century he practiced in Minneapolis and later moved to California. He died at Los Angeles on September 4, 1910.

---

‡Boston, 1919, 80 pages.

§Gorge B. Weiser, "History of Medicine in Brown County," MINNESOTA MEDICINE, p. 187, March, 1941.

Seeley, John Sanford.—He was born at Carlysle, N. Y., on June 12, 1852, to Isaac Seeley and Mary Fraser, both natives of the State of New York. He attended the public school at Saduo Bay, N. Y., and received his higher education at Carlysle Academy, Carlysle, N. Y. He started the study of medicine by reading in the office of Dr. Roscoe (or Rusco) at Carlysle, N. Y., and which he continued for four years. After that he entered the Medical School of the University of Michigan from which he graduated with the degree of Doctor of Medicine in the spring of 1876. At the time he started reading medicine in the office of Dr. Roscoe of Carlysle, he took to the lecture platform to become an advocate of local option. By the time he was eighteen years of age he was known throughout New York State as the "boy lecturer on the liquor evil." Illustrating his lectures with lantern slides, the young man traveled from town to town arousing sentiment against drunkenness and preaching sobriety throughout the length and breadth of his native state. The idealistic youth was an ardent and real reformer. Each summer during his several years of study at Ann Arbor, the young medical student resumed his anti-liquor lectures in the State of New York. By these net earnings he made enough money to pay for most of his medical education.

Following his graduation as an M.D., the young Dr. Seeley went to Farmington. Minnesota, where he hung out his shingle and lived with his paternal uncle, Nathan Seeley. While starting his practice, he worked as an ordinary farmhand in the harvest fields the summer and fall of his first year in Farmington. He went to Meeker County, but soon returned to Farmington to continue with his budding practice there. He married Miss Jennie Flood of Morristown, Minnesota, at Cordova, Minnesota, where he had removed to practice, in 1878, two years after he had first opened his office in Farmington. He practiced four years at Cordova. Again, he removed to Morristown, where he practiced for three years. In the year 1886, he made his final move to settle down to his permanent practice at Faribault, Minnesota.

Dr. John Sanford Seeley was licensed to practice medicine and surgery in the State of Minnesota, on April 15, 1884. He was also licensed in the State of Kansas and Washington. Including his medical apprenticeship under the tutelage of Dr. Roscoe, his association with the medical profession covered a period of well over fifty years. He died suddenly on Sunday morning, March 9, 1924, while in the act of dressing. The cause of his sudden death was either coronary or cerebral. He died within a few minutes following the onset, and before the arrival of the first M.D., Dr. Charles M. Robilliard of Faribault, to reach his deathbed. He was in his seventy-second year at the time of his death and had practiced in Faribault for thirty-eight years. He had suffered a mild paralytic stroke on February 22, 1924. From that time until his sudden death, he greeted those who visited him with a smile and chatted freely with them. (His speech was not affected by his stroke). He was also able to walk about the room all by himself. Dr. Seeley was active in Masonic circles, and was the most active of the original sponsors of the local De Molay. His daughter, Laura I. Seeley, M.D., resides at Long Beach, California, and his son, I. F. Seeley, M.D., at Tucson, Arizona.

The writer had the privilege of knowing Dr. Seeley during the last six years of his life. The picture of him the most clearly fixed in the writer's memory is that of the doctor in his Prince Albert coat, high-crowned silk hat, and swinging his cane (which he never carried except on Sundays, certain holidays, and on formal occasions), parading up and down Faribault's Main Street on nice Sunday mornings of late spring, summer, and early fall with his lady clinging to the doctor's left arm. Everybody in town and throughout all the surrounding countryside knew who Dr. Seeley was. He was an individualist with certain eccentricities of speech and manner that made him stand out amongst his fellows and which stamped the memory of his distinctive personality, peculiarly all his own, on the minds of all who knew him. He was one in a million, who will not soon be forgotten.

Skeels, A. P.—(1829-1872) He graduated from the Homeopathic Medical College of Pennsylvania in 1867. He went west to St. Louis where he became professor of Materia Medica in the old Homeopathic Medical College of Missouri. While there he was editor of the *Western Homeopathic Observer*. He came to Northfield in January, 1870, suffering from pulmonary tuberculosis and he died there on May 16, 1872. He is said to have been the preceptor of Henry Hutchinson (1849-1910) of Northfield and St. Paul.*

Smith, Patrick Albert.—He was born July 27, 1866, at North Nation Mills, Province of Quebec, Canada, the son of Josiah and Mary (O'Brien) Smith. The family moved to Alfred, Ontario, and later to Papineauville, Province of Alberta, where he attended the English school. Following elementary work received in the Canadian public schools, he continued his education at higher institutions of learning. He graduated from the University of Ottawa in 1884, and was granted his M.D. degree by Jefferson Medical College, Philadelphia in 1893. He was married at Montreal, Canada, to Miss Lilias H. Brady of Montebello, P.Q., Canada, on April 20, 1892. She preceded him in death on March 4, 1916.

Dr. Smith began his career as a physician in Minnesota, at Dundas, soon after his graduation in Philadelphia, in 1893. He moved to Faribault in 1895. In 1910, he and Rev. Pere Monge, then pastor of the Sacred Heart church in Faribault, went to Europe together. Dr. Smith did some post-graduate work in London, Paris, and Vienna. While in Vienna he was elected a member of the Vienna branch of the American Medical Association. During his forty years' residence in Faribault, Dr. Smith played a prominent role in the community's political and professional life. In 1917 he was a candidate for mayor of Faribault. On February 22, 1922, he was married to Miss Loretta Lieb, her death occurring on October 7, of the same year. Dr. Smith served as Rice County coroner for several years. He resigned that position in 1928 to become a candidate for county commissioner. Following his election, he served continuously up to the time of his death on November 27, 1935.

For three years, from the destruction of the old courthouse by fire on February 25, 1931, to the dedication of the beautiful new building, about as fireproof as it could be built, on December 22, 1934, he devoted so much of his time, energetically and tirelessly, that he had to sacrifice much of his big practice to assure the erection of the new structure. He successfully won over all obstacles, including litigation, labor troubles, and factional disputes. Dr. Patrick Albert Smith is the one outstanding man responsible for Rice County's magnificient new courthouse, one of the finest in the State of Minnesota. It is a befitting monument to his fighting Irish heart. Old friends and patients, many of whom he had shown charity into the fourth generation, having brought several thousands of them into the world, the poor served as cheerfully and without remuneration in money as those better off, contributed to the severe coronary insult (a second or third) that resulted in his death. Professionally, the perfect gentleman was held in high esteem by his professional brothers, friends, and the public.

---

*This information is taken from James Eckman, "Homeopathic and Eclectic Medicine in Minnesota," Minnesota Medicine, p. 868, October, 1941.

(To be concluded in October issue)

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

230 Lowry Medical Arts Bldg., Saint Paul 2, Minnesota

F. H. Magney, M.D., Secretary

PHYSICIANS LICENSED FEBRUARY 4, 1955

January, 1955, Examination

Name	*School*			*Address*
LZ, George Pickering	U. of Illinois	MD	1952	200 1st St., S.W., Rochester, Minn.
SCOM, John Upton	Northwestern U.	MD	1953	Mpls. Gen. Hospital, Minneapolis, Minn.
ENNAN, Joseph George	U. of Bologna Italy	MD	1947	407 Granite Exchange, St. Cloud, Minn.
HANDLER, Howard Christy	Emory U.	MD	1951	U. of Minn. Hospitals, Minneapolis, Minn.
OTE, Jacques	Laval U.	MD	1951	200 1st St., S.W., Rochester, Minn.
OBLER, Manfred	Eberhard-Karls U. Germany	MD	1951	829 Payne Ave., St. Paul, Minn.
RICKSEN, Dean Marshall	U. of Illinois	MD	1954	Veterans' Adm. Hosp., Minneapolis, Minn.
ENRIE, John Nathanial	U. of Utah	MD	1952	200 1st St., S.W., Rochester, Minn.
UGHES, Lewis Edwin	U. of California	MD	1953	314 E. Grand Ave., Eau Claire, Wis.
NNACH, Joseph Robert	U. of Minnesota	MD	1954	3250 35th Ave. S., Minneapolis, Minn.
UNISKIS, Ruta Orlauskaite	U. of Kaunas, Lithuania	"Physician"	1942	Mounds Park Hospital, St. Paul, Minn.
EGER, Francois	U. of Montreal	MD	1952	200 1st St., S.W., Rochester, Minn.
AIER, Edwin Robert	U. of Kansas	MD	1943	200 1st St., S.W., Rochester, Minn.
OFFITT, Emerson Amos	Dalhousie U.	MD	1951	200 1st St., S.W., Rochester, Minn.
AKAS, Osvaldas	U. of Dusseldorf Germany	"Physician"	1948	State Hospital, Ionia, Michigan
ELSON, John Douglas	U. of Minnesota	MD	1954	401 N. 40th Ave. W., Duluth, Minn.
ESS, Richard Alton	U. of Minnesota	MD	1954	U. of Minn. Hospitals, Minneapolis, Minn.
AULSEN, Elsa Caroline Proehl	U. of Minnesota	MD	1954	U. of Minn. Hospitals, Minneapolis, Minn.
ECK, Owen Calvin	Kansas U.	MD	1951	200 1st St., S.W., Rochester, Minn.
ETERSON, Lowell Frederick Albert	Northwestern U.	MD	1951	200 1st St., S.W., Rochester, Minn.
EDDING, Foster Kinyon	U. of Pennsylvania	MD	1954	4119 E. Lake St., Minneapolis, Minn.
ODIN, Ernst	U. of Vienna Austria	MD	1949	U. of Michigan Hospital, Ann Arbor, Mich.
UTH, Bradley Robert	U. of Minnesota	MD	1952	818 19th Ave. E., Duluth, Minn.
AGER, John Harmer	Geo. Washington U.	MD	1952	200 1st St., S.W., Rochester, Minn.
ELCK, Wolfgang Wilhelm Theodor Erich	U. of Hamburg Germany	MD	1952	2703 E. Lake St., Minneapolis, Minn.
KWORCOW, George	U. of Heidelberg, Germany	MD	1952	545 Capitol Blvd., St. Paul, Minn.
VERNIER, Robert L.	U. of Cincinnati	MD	1952	U. of Minn. Hospitals, Minneapolis, Minn.
WEEKS, Byron Thomas	U. of Utah	MD	1951	Veterans' Adm. Hosp., Minneapolis, Minn.
WILLIAMS, Richard Eugene	St. Louis U.	MD	1954	Mpls. Gen. Hospital, Minneapolis, Minn.

Reciprocity Candidates

Name	*School*			*Address*
BURTON, Truman Young	U. of Utah	MD	1950	200 1st St., S.W., Rochester, Minn.
CHRISTIANSON, Mary Helen Faubion	U. of Texas	MD	1953	200 1st St., S.W., Rochester, Minn.
CASSEL, William Gilbert	Western Reserve	MD	1951	200 1st St., S.W., Rochester, Minn.
CLEMENTS, Betty Grace Elizabeth	U. of Nebraska	MD	1952	200 1st St., S.W., Rochester, Minn.
GRIFFITHS, Edward Krohn	U. of Pittsburgh	MD	1953	200 1st St., S.W., Rochester, Minn.
GRIZZLE, Claude Oliver	Stanford U.	MD	1954	200 1st St., S.W., Rochester, Minn.
HAMSA, William Rudolph	U. of Nebraska	MD	1929	527 Medical Arts Bldg., Omaha, Neb.
HICKS, JR., Wm. Wynne	Jefferson Med. Coll.	MD	1953	200 1st St., S.W., Rochester, Minn.
HIGGINS, Dennis Curran	Loyola U.	MD	1953	200 1st St., S.W., Rochester, Minn.
HILDYARD, Victor Herbert	U. of Kansas	MD	1942	Mpls. Gen. Hospital, Minneapolis, Minn.
HUNT, JR., Oliver Raymond	U. of Louisville	MD	1951	200 1st St., S.W., Rochester, Minn.
JARVIS, JR., Walter Hearn	U. of Texas	MD	1942	200 1st St., S.W., Rochester Minn.
KEOWN, JR., John Thomas	U. of Oklahoma	MD	1950	Pender, Nebr.
LANGRALL, JR., Harrison Morton	U. of Maryland	MD	1953	200 1st St., S.W., Rochester Minn.
LINDQUIST, Richard Harmon	U. of Louisville	MD	1947	200 1st St., S.W., Rochester Minn.
MARTIN, Jr., Peter Vincent	Hahnemann Med. Coll.	MD	1947	Prudential Ins. Co., Minneapolis, Minn.
MILES, JR., James Verner	U. of Pennsylvania	MD	1947	200 1st St., S.W., Rochester Minn.
PONTIUS, John Gilmore	U. of Pennsylvania	MD	1953	200 1st St., S.W., Rochester Minn.
RAYNAK, Frank Raymond	Temple U.	MD	1947	200 1st St., S.W., Rochester Minn.
RIBISI, Albert Prescott	Loyola U.	MD	1948	200 1st St., S.W., Rochester Minn.
ROBERTS, Frank Edwin	U. of So. California	MD	1954	17600 Chase St., Northridge, Calif.
SCALLIN, James Francis	U. of Michigan	MD	1953	U. of Minn. Hospitals, Minneapolis, Minn.
SHERANIAN, Lincoln Oscar	Stanford U.	MD	1954	200 1st St., S.W., Rochester Minn.
TOBIAN, JR., Louis	Harvard U.	MD	1943	U. of Minn. School of Med., Minneapolis, Minn.

National Board Candidates

Name	*School*		*Address*
BATT, Bernard	N. Y. Med. Coll.	MD 1949	Presbyterian Hospital, N. Y., N. Y.
BURKE, Barbara Aune	Woman's Med. Coll., Pa.	MD. 1953	U. of Minn. Hospitals, Minneapolis, Mir
CARNEVALI, John Francis	Georgetown U.	MD 1953	200 1st St., S.W., Rochester Minn.
CLEMETT, Arthur Reid	U. of Rochester	MD 1950	U. of Minn. Hospitals, Minneapolis, Mir
COFFEY, Wm. Francis Xavier	Jefferson Med. Coll.	MD 1953	6606 Woodcrest Ave., Philadelphia, Pa.
DREWRY, Garth Richard	Harvard U.	MD 1952	U. of Minn. Hospitals, Minneapolis, Mir
EICHENLAUB, John Ellis	Johns Hopkins	MD 1945	U. of Minn., Students Health Service, Minneapolis, Minn.
EVANS, Harold Warren	Cornell U.	MD 1949	200 1st St., S.W., Rochester Minn.
FAIRBAIRN, II, John Fitzgerald	U. of Buffalo	MD 1945	1132 Delaware Ave., Buffalo, N. Y.
GARDNER, Gawinn Bennion	U. of Utah	MD 1952	200 1st St., S.W., Rochester Minn.
GARDNER, John Underhill	N. Y. Med. Coll.	MD 1953	200 1st St., S.W., Rochester Minn.
GLUECK, Bernard Charles	Harvard U.	MD 1938	1441 E. River Rd., Minneapolis, Minn.
GOETZ, Frederick Charles	Harvard U.	MD 1946	U. of Minn. Hospitals, Minneapolis, Mir
JOHNSON, Norman Paul	State U. of Iowa	MD 1948	329 W. 15th St., Minneapolis, Minn.
LEE, Robert Eugene	U. of Illinois	MD 1951	200 1st St., S.W., Rochester Minn.
LYONS, William Stewart	Geo. Washington U.	MD 1951	200 1st St., S.W., Rochester Minn.
MEIER, Donald Walter	U. of Rochester	MD 1950	200 1st St., S.W., Rochester Minn.
MESSER, James Walter	Johns Hopkins U.	MD 1953	200 1st St., S.W., Rochester Minn.
MOSKOWITZ, Roland Wallace	Temple U.	MD 1953	200 1st St., S.W., Rochester Minn.
MYERS, John William	U. of Iowa	MD 1953	103 W. 1st St., Canby, Minn.
OBERT, Mary Newton	Temple U.	MD 1950	915 3rd Ave., S.E., Rochester, Minn.
ROBINSON, Hugh Payson	U. of Rochester	MD 1953	200 1st St., S.W., Rochester Minn.
SHEA, Daniel Wright	St. Louis U.	MD 1951	200 1st St., S.W., Rochester Minn.
WATTENBERG, Lee Wolff	U. of Minnesota	MD 1950	U. of Minn. School of Med., Minneapol Minn.
WORRELL, Janet	Woman's Med. Coll.	MD 1953	200 1st St., S.W., Rochester Minn.
WORTHINGTON, JR., John Willian	Duke U.	MD 1951	200 1st St., S.W., Rochester Minn.

PHYSICIANS LICENSED MAY 6, 1955

April, 1955, Examination

Name	*School*		*Address*
ALTON, Donald Gilman	U. of Rochester	MD 1953	Box 425, Bird Island, Minn.
CAREY, Beverly Jane Baxter	Queen's U.	MD 1951	Rochester State Hosp., Rochester, Minn.
DEUTSCH, Robert John	Marquette U.	MD 1954	4831½ W. 5th St., Duluth, Minn.
EPP, Dennis Lee	Northwestern U.	MD 1954	517 Popular Ave., Philadelphia, Miss.
FEDDERS, Gerhard	U. of Youryeff, Russia	MD 1913	State Hospital, Anoka, Minn.
GOODLIN, Robert Clair	U. of Oregon	MD 1953	U. of Minn. Hospitals, Minneapolis, Min
HALVERSON, Donald Eugene	U. of Minnesota	MD 1954	Winnebago, Minn.
HAMEL, Arnold Louis	Marquette U.	MD 1954	675 Water St., Excelsior, Minn.
HATFIELD, Clinton Bruce	U. of Alberta	MD 1953	U. of Minn. Hospitals, Minneapolis, Min
HILL, Norman Charles	U. of Manitoba	MD 1952	200 1st St., S.W., Rochester Minn.
JENSEN, John Arnold	U. of Minnesota	MD 1954	119 N. Broadway, Crookston, Minn.
LARSON, Wyllis Gene	U. of Washington	MD 1954	111 E. 4th St., Northfield, Minn.
LOFSTROM, Dennis Earl	U. of Minnesota	MD 1954	Pine River, Minn.
MERIE, Josephine Nancy	McGill U.	MD 1953	200 1st St., S.W., Rochester Minn.
MULLEN, Sanford Allen	Columbia U.	MD 1949	U. of Minn. Hospitals, Minneapolis, Min
NELSON, Ralph Alfred	U. of Minnesota	MD 1953	U. of Minn. Hospitals, Minneapolis, Min
RAAEN, Olaf Juel	U. of Oslo, Norway	MD 1939	214 Wesley Temple Bldg., Minneapol Minn.
SEBRECHTS, Paul	U. of Louvain, Belgium	MD 1946	515 18th Ave., S.W., Rochester, Minn.
SLETTEN, Ivan Wayne	U. of Wisconsin	MD 1954	Mpls. Gen. Hospital, Minneapolis, Minn
SOWELL, Richard Chester	U. of Oregon	MD 1954	11207 S.E. Harold St., Portland, Ore.
TAYLOR, Keith Alan	U. of Oregon	MD 1954	500 Eastman Bldg., Boise, Idaho
THOMPSON, Russell Alden	U. of Minnesota	MD 1954	Professional Bldg., Cosmos, Minn.
WESTLEY, Kent Forbes	Temple U.	MD 1943	U. of Minn. Hospitals, Minneapolis, Min

Reciprocity Candidates

Name	*School*		*Address*
CHITTUM, John Raymond	Duke U.	MD 1953	East Range Clinic, Aurora, Minn.
DeBELLY, Carl George	U. of Nebraska	MD 1954	McGrew, Nebr.
EDWARDS, JR., Henry Grady	Med. Coll., Georgia	MD 1953	200 1st St., S.W., Rochester Minn.
GRAF, George Paul	U. of Wisconsin	MD 1950	200 1st St., S.W., Rochester Minn.
HANSEN, Robert Henry	Louisiana U.	MD 1942	200 1st St., S.W., Rochester, Minn.
KASPER, Robert Eugene	Marquette U.	MD 1949	U. of Minn. Hospitals, Minneapolis, Min
KRUEGER, Norman Leland	U. of Iowa	MD 1950	128 S. 76th St., Milwaukee, Wis.
KUYKENDALL, Samuel James	Vanderbilt U.	MD 1949	200 1st St., S.W., Rochester, Minn.
McCOWN, Louis Kenneth	Tulane U.	MD 1949	200 1st St., S.W., Rochester, Minn.

Name	*School*			*Address*
LSON, Gunard Arvid	U. of So. California	MD	1954	200 1st St., S.W., Rochester, Minn.
LAN. Robert Kay	U. of Vermont	MD	1947	Western Montana Clinic, Missoula, Mont.
TERMAN, Albert Frederick	Wash. U., St. Louis, Mo.	MD	1952	200 1st St., S.W., Rochester, Minn.
YCICH, John Michael	St. Louis U.	MD	1949	200 1st St., S.W., Rochester, Minn.
VANSON, JR., Clarence Hilding	U. of Nebraska	MD	1954	Northwestern Hospital, Minneapolis, Minn.

National Board Candidates

Name	*School*			*Address*
ECKER, Barry	New York U.	MD	1952	200 1st St., S.W., Rochester, Minn.
NG, Victoria Kuo-fen	U. of Michigan	MD	1949	10410 E. Jefferson, Detroit. Mich.
INER, Ernest August	Columbia U.	MD	1952	U. of Minn. Hospitals, Minneapolis, Minn.
TSTEIN, Jerome	State U. of N. Y.	MD	1953	U. of Minn. Hospitals, Minneapolis, Minn.
HAEFER, Joseph Charles	U. of Wisconsin	MD	1950	200 1st St., S.W., Rochester, Minn.
ILDER, Walter Llewellyn	Harvard U.	MD	1950	1801 Lyndale Ave. S., Minneapolis, Minn.

PHYSICIANS LICENSED JULY 8, 1955

June, 1955, Examination

Name	*School*			*Address*
CKROYD, Albert Edwin	U. of Minnesota	MD	1955	San Diego Co. Gen. Hosp., San Diego, Calif.
NDERSON, Oscar Donald	U. of Minnesota	MD	1955	Ancker Hospital, St. Paul, Minn.
NSELL, Julian Samuel	Tufts Med. Coll.	MD	1951	U. of Minn. Hospitals, Minneapolis, Minn.
ULICK, Ernest James	Coll. Med. Evang.	MD	1954	Belgrade, Minn.
ACKER, Gordon Lewis	U. of Minnesota	MD	1955	King Co. Hospital, Seattle, Wash.
ACKUS, Lloyd Benjamin	U. of Minnesota	MD	1955	Highland-Alameda Co. Hosp., Oakland, Calif.
ACKUS, Reno Eugene	U. of Minnesota	MD	1955	Highland-Alameda Co. Hosp., Oakland, Calif.
ECKETT, Peter Gordon Stewart	Trinity Col.., Ireland Bach. Med. & Surg. & Ob.		1945	951 E. LaFayette, Detroit, Mich.
ERG, Bruce Oscar	U. of Minnesota	MD	1955	Fitzsimons Army Hosp., Denver, Colo.
ERGERON, Dale A.	U. of Minnesota	MD	1955	Letterman Army Hosp., San Francisco, Calif.
INGER, Charles Melvin	U. of Minnesota	MD	1955	Highland-Alameda Co. Hosp., Oakland, Calif.
ITTICK, Wilbur Howard	U. of Oregon	MD	1952	Mpls. Gen. Hospital, Minneapolis. Minn.
LOCH, Henry Simon	U. of Minnesota	MD	1955	U. of Minn. Hospitals, Minneapolis, Minn.
LOOM, David	U. of Minnesota	MD	1955	King Co. Hospital, Brooklyn, N. Y.
OEHLKE, Russell R.	U. of Minnesota	MD	1955	U.S.P.H.S. Hospital, Baltimore, M.D.
OLANDER, John Ivar	U. of Minnesota	MD	1955	Vets' Adm. Hosp., Long Beach, Calif.
OLT, Donald Arthur	U. of Minnesota	MD	1955	Walter Reed Army Hosp, Washington, D. C.
RAINARD, John Brimhall	U. of Minnesota	MD	1955	Ancker Hospital, St. Paul, Minn.
BRAZIE, Joseph V.	U. of Oregon	MD	1954	1/Lt. MC, USA, Armish/MAAG 8673 DU APO 205, N. Y., N. Y.
UCKLEY, Robert Emmett	U. of Minnesota	MD	1955	So. Pacific RR Hosp., San Francisco, Calif.
URNETT, George Hilgard	U. of Chicago	MD	1954	Service Mem. Inst., U. of Wis., Madison, Wis.
BUSHMAN. David E.	U. of Minnesota	MD	1955	St. Vincent's Hospital, Portland, Ore.
CALLEWART, Robert A.	U. of Minnesota	MD	1955	U. of Wisconsin Hosp., Madison, Wis.
CARLIN, Jean Effal	U. of Minnesota	MD	1954	U. of Minn. Hospitals, Minneapolis, Minn.
CARLSON, Homer John	U. of Minnesota	MD	1955	St. Luke's Hospital, Duluth, Minn.
CONNOLLY, Daniel Charles	University Coll., Ireland	MD	1948	200 1st St., S.W., Rochester, Minn.
CORNWELL, Samuel Owen	U. of Minnesota	MD	1955	Hillcrest Rd., Chapel Hill, N. C.
CORSER, David Hewson	Washington U (MO)	MD	1954	639 E. 18th St., Minneapolis, Minn.
COURTEAU, Robert David	U. of Minnesota	MD	1955	St. Mary's Hosp., Minneapolis, Minn.
COUTURE, Lorraine	U. of Manitoba	MD	1955	Baltimore City Hosp., Baltimore, Md.
DELANEY, John P.	U. of Minnesota	MD	1955	Santa Clara Co. Hosp., San Jose, Calif.
DION, Francis Richard	U. of Minnesota	MD	1955	Mpls. Gen. Hospital, Minneapolis, Minn.
DUVALL, III, Arndt John	U. of Minnesota	MD	1955	Ancker Hospital, St. Paul, Minn.
ELLINGSON, Richard Bennett	U. of Minnesota	MD	1955	4029 43rd Ave. S., Minneapolis, Minn.
ENGLUND, Garth Walfred	U. of Minnesota	MD	1955	Denver Gen. Hospital, Denver, Colo.
EPSTEIN, Wolfgang	U. of Minnesota	MD	1955	San Francisco Hosp., San Francisco, Calif.
FINK, Gerald Howard	U. of Minnesota	MD	1955	Mt. Sinai Hospital, Minneapolis, Minn.
FISH, George Herbert	U. of Minnesota	MD	1955	Virginia Mason Hosp., Seattle, Wash.
FRUCHTMAN, Stanley Arnold	U. of Minnesota	MD	1955	Mt. Sinai Hospital, Minneapolis, Minn.
GAMBLE, Charles Northam	U. of Minnesota	MD	1955	Ancker Hospital, St. Paul, Minn.
GARETZ, Floyd Kenneth	U. of Minnesota	MD	1955	Mpls. Gen. Hospital, Minneapolis, Minn.
GILLIS, Daniel Alexander	Dalhousie U.	MD	1953	200 1st St., S.W., Rochester, Minn.
GOEPFERT, Mary	U. of Minnesota	MD	1952	Veterans' Adm. Hosp., Minneapolis, Minn.
GORDON, Edwin Michael	U. of Minnesota	MD	1955	San Diego Co. Gen. Hosp., San Diego, Calif.
GORDON, John Ralph	Queen's U.	MD	1951	U. of Minn. Hospitals, Minneapolis, Minn.

Name	*School*		*Address*
GRIFFIN, Lee Martin	U. of Minnesota	MD 1955	U. S. Naval Hosp., Great Lakes, Ill.
GUSTAFSON, David Carl	Johns Hopkins	MD 1954	Robertsdale, Ala.
GUSTAFSON, Robert Warner	U. of Minnesota	MD 1955	St. Luke's Hospital, Duluth, Minn.
HALL, John Joseph	U. of Minnesota	MD 1955	St. Mary's Hospital, Minneapolis, Minn.
HALVERSON, Kermit John	U. of Minnesota	MD 1955	Ancker Hospital, St. Paul, Minn.
HELWIG, JR., Karl Lyle	U. of Wisconsin	MD 1954	Kerkhoven, Minn.
HERRICK, Donald Willard	U. of Minnesota	MD 1955	St. Joseph's Hospital, St. Paul, Minn.
HILGEDICK, William Ralph	U. of Minnesota	MD 1955	St. Luke's Hospital, Duluth, Minn.
HOLM, Owen W.	U. of Minnesota	MD 1955	Ancker Hospital, St. Paul, Minn.
HORNS, John Willard	U. of Minnesota	MD 1955	U. of California Hosp., Los Angeles, Ca
HUSEBY, Thomas Lester	U. of Minnesota	MD 1955	U. of Minn. Hospitals, Minneapolis, Mi
HUSEBYE, Kjeld Oddvar	U. of Oslo, Norway	MD 1951	339 Lowry Medical Arts Bldg., St. Pa Minn.
JACOBSON, Maynard Edward	U. of Minnesota	MD 1955	Mpls. Gen. Hospital, Minneapolis, Min
JOHNSON, Lewis Allen	U. of Minnesota	MD 1955	So. Pacific Gen. Hosp., San Francisco, Ca
JOHNSON, Ray Allen	U. of Minnesota	MD 1955	Highland-Alameda Co. Hosp., Oakland Calif.
JORDHEIM, Robert Phillips	Northwestern U.	MD 1954	1507 A Sycamore, Big Spring, Texas
KANE, Dennis James	U. of Minnesota	MD 1955	U. of Minn. Hosp., Minneapolis, Minn.
KLEPP, Arne Leonard	U. of Minnesota	MD 1955	Vets' Adm. Hosp., Long Beach, Calif
KNUDSON, Harris Willard	U. of Minnesota	MD 1955	Vets' Adm. Hosp., Long Beach, Calif
KNUTSON, Kenneth Roger	U. of Minnesota	MD 1955	St. Luke's Hospital, Duluth, Minn.
KOOP, JR., Severin H.	U. of Minnesota	MD 1955	Ancker Hospital, St. Paul, Minn.
KRUGER, JR., Elmer Lawrence	Med. Coll., Georgia	MD 1954	Mesaba Clinic, Hibbing, Minn.
KUNIN, Richard Allen	U. of Minnesota	MD 1955	New York Hospital, N. Y., N. Y.
LARSON, Theodore Gordon	U. of Minnesota	MD 1955	Mpls. Gen. Hospital, Minneapolis, Min
LEAVITT, Clark Thomas	U. of Alberta	MD 1954	200 1st St., S.W., Rochester, Minn.
LEE, John Roland	U. of Minnesota	MD 1955	Mpls. Gen. Hospital, Minneapolis, Min
LEONARD, Arnold S.	U. of Minnesota	MD 1955	Mpls. Gen. Hospital, Minneapolis, Min
LEONARD, Stanley Alan	U. of Minnesota	MD 1955	U. of Minn. Hospitals, Minneapolis, Mi
LESSARD, Richard Joseph	U. of Minnesota	MD 1955	5303 N. Thomas Ave., Minneapolis, Mi
LONEY, William Robert Ray	U. of Minnesota	MD 1955	Kansas City Gen. Hosp., Kansas City, M
LOOFBOUROW, John Colm	U. of Minnesota	MD 1955	Gorgas Hospital, Ancon, Canal Zone
LYONS, Michael Murray	Loyola U.	MD 1948	U. of Minn. Hospitals, Minneapolis, Mi
MARSCHKE, Gerald R.	U. of Minnesota	MD 1955	Vets' Adm. Hosp., Long Beach, Calif.
MARTIN, Donald Campbell	U. of Minnesota	MD 1955	Vets' Adm. Hosp., Long Beach, Calif.
MASSEE, Joseph Suter	U. of Minnesota	MD 1955	Mpls. Gen. Hospital, Minneapolis, Min
MEYERS, Phillip Henry	U. of Minnesota	MD 1955	Kings Co. Hospital Center, Brooklyn, N.
MORRIS, David Leslie	U. of Wisconsin	MD 1954	2302 Bruce Ave., Tucson, Ariz.
MOYER, Donald Glenn	U. of Minnesota	MD 1955	Letterman Army Gen. Hospital, San Francisco, Calif.
MURTAUGH, Robert Jean	U. of Minnesota	MD 1955	405 7th Ave. S.E., Minneapolis, Minn.
MUTCH, JR., Milton Gardner	U. of Minnesota	MD 1955	Mpls. Gen. Hospital, Minneapolis, Minn.
NELDNER, Kenneth Herbert	U. of Minnesota	MD 1955	Ancker Hospital, St. Paul, Minn.
O'KEEFE, Norbert John	U. of Minnesota	MD 1955	St. Joseph's Hospital, St. Paul, Minn.
OBERT, Gerard Joseph	U. of Pittsburgh	MD 1953	State Hospital, Rochester, Minn.
OLSEN, Jay Richard	Cornell U.	MD 1953	U. of Minn. Hospitals, Minneapolis, Min
OLSON, Lloyd Laures	U. of Washington Seattle	MD 1954	Veterans' Adm. Hosp., Minneapolis, Mi
OLSON, Robert William	U. of Minnesota	MD 1955	Orange Co. Gen. Hosp., Orange, Calif.
OSTERBERG, Kenneth Arvid	U. of Minnesota	MD 1955	Mpls. Gen. Hospital, Minneapolis, Minn.
OWENS, Frank Joseph	U. of Minnesota	MD 1955	Ancker Hospital, St. Paul, Minn.
PALMER, Karl Arthur	U. of Minnesota	MD 1955	City Hospital, Cleveland, Ohio
PETERSON, Raymond Dale August	U. of Minnesota	MD 1955	3633 45th Ave. S., Minneapolis, Minn.
PIERCE, Gordon Le Ray	U. of Minnesota	MD 1955	Kaiser Foundation Hosp., Oakland, Cal
REMSBERG, John R. S.	U. of Minnesota	MD 1955	1846 Wellesley Ave., St. Paul, Minn.
REYNOLDS, Donald Parker	U. of Manitoba	MD 1948	Swedish Hospital, Minneapolis, Minn.
REYNOLDS, James Stanton	U. of Minnesota	MD 1955	Meadowbrook Hospital, Hempstead, N. Y
RONDEAU, Eugene Thomas	U. of Minnesota	MD 1954	Hilltop House Apts., Wernersville, Pa.
ROSS, Howard David	U. of Minnesota	MD 1954	Vet. Adm. Center, Los Angeles, Calif.
ROTENBERG, Samuel	U. of Minnesota	MD 1955	Kings Co. Hospital Center, Brooklyn, N.
RUNQUIST, Richard Keith	U. of Minnesota	MD 1954	Westbrook, Minn.
RYDELL, Robert Earl T.	U. of Minnesota	MD 1955	Mpls. Gen. Hospital, Minneapolis, Minn
SALOVICH, Edward Lamont	U. of Minnesota	MD 1955	Parkland Mem. Hospital, Dallas, Texas
SCHUFT, James Robert	U. of Minnesota	MD 1955	St. Mary's Hospital, Duluth, Minn.
SCHULZ, Robert Wilhelm	U. of Minnesota	MD 1955	St. Luke's Hospital, Duluth, Minn.
SEIFERT, Donald Ralph	Creighton U.	MD 1955	St. Mary's Hospital, Duluth, Minn.
SHANNON, Lloyd Wilburn	U. of Manitoba	MD 1946	Atlantic Coastline RR Hospital, Waycr Ga.
SHELDON, Wilmer George	U. of Minnesota	MD 1955	Ancker Hospital, St. Paul, Minn.
SHEPARD, Richard	U. of Minnesota	MD 1955	Mpls. Gen. Hospital, Minneapolis, Minn.
SHORT, Marshall H.	U. of Minnesota	MD 1955	Mpls. Gen. Hospital, Minneapolis, Minn.
SILVIS, Stephen Edward	U. of Minnesota	MD 1955	St. Joseph's Hospital, St. Paul, Minn.

Name	*School*		*Address*
MMONS, Richard Knute	U. of Minnesota	MD 1955	3939 Chowen Ave. S., Minneapolis, Minn.
PE, James Willard	U. of Minnesota	MD 1955	Mpls. Gen. Hospital, Minneapolis, Minn.
UNGAARD, Rolv Kjelberg	U. of Oslo, Norway	MD 1950	3920 Sunnyside Ave., Minneapolis, Minn.
IITH, Alan Garrigues	U. of Minnesota	MD 1955	D. C. Gen. Hospital, Washington, D. C.
RKNESS, Paul O.	U. of Minnesota	MD 1955	Highland-Alameda Co. Hospital, Oakland, Calif.
OLEN, Keith H.	U. of Minnesota	MD 1955	Tripler Army Hospital, Oahu, T. H.
ROBEL, Claire John Albert	U. of Minnesota	MD 1955	Mpls. Gen. Hospital, Minneapolis, Minn.
BAK, Barbara Hanson	U. of Minnesota	MD 1955	Mpls. Gen. Hospital, Minneapolis, Minn.
VAIMAN, Kenneth Fred	U. of Minnesota	MD 1955	Mpls. Gen. Hospital, Minneapolis, Minn.
VAN, Harold James Charles	U. of London Bach. Med. & Surg.	1945	200 1st St., S.W., Rochester, Minn.
VANSON, Ralph Herbert	U. of Minnesota	MD 1955	Mercy Hospital, Toledo, Ohio
VENSEN, Don Philip	U. of Minnesota	MD 1955	St. Luke's Hospital, Duluth, Minn.
VENSON, JR., Richard William	U. of Minnesota	MD 1955	Hibbing, Minn.
VERSON, Leslie Arthur	U. of Minnesota	MD 1955	St. Mary's Hospital, Duluth, Minn.
IOMFORD, Neil Roger	U. of Minnesota	MD 1955	Highland-Alameda Co. Hospital, Oakland, Calif.
HOUIN, Laurence Gonzague	U. of Minnesota	MD 1943	2229 3rd Ave. E., Hibbing, Minn.
RUPPMAN, Edward S.	U. of Minnesota	MD 1955	Jackson Mem. Hospital, Miami, Fla.
VETEN, Omar A.	U. of Minnesota	MD 1955	Highland-Alameda Co. Hospital, Oakland, Calif.
AALER, Robert T.	U. of Minnesota	MD 1955	Parkland Mem. Hospital, Dallas, Texas
ALASEK, Frances Elizabeth	U. of Minnesota	MD 1955	Sterling-Winthrop Res. Institute, Rensselaer, N. Y.
AUBEL, Carol Lynn	U. of Minnesota	MD 1955	Mpls. Gen. Hospital, Minneapolis, Minn.
ANDERPOOL, Thomas Earl	U. of Minnesota	MD 1955	Ancker Hospital, St. Paul, Minn.
VEATHERHEAD, Donald Stuart Philip	U. of Manitoba	MD 1948	U. of Minn. Hospitals, Minneapolis, Minn.
HITE, James George	U. of Minnesota	MD 1955	Receiving Hospital, Detroit, Mich.
VILLIAMS, Francis Richard	U. of Minnesota	MD 1955	Presbyterian Hospital, Chicago, Ill.
VILSON, Robert K.	U. of Minnesota	MD 1955	Ancker Hospital, St. Paul, Minn.
VITTER, Robert LaMotte	U. of Minnesota	MD 1955	Mt. Sinai Hospital, Minneapolis, Minn.
VOOD, Lloyd Thomas	U. of Minnesota	MD 1954	Box 465, Forest Lake, Minn.
VOOLFREY, Bertram Ford	U. of Minnesota	MD 1955	Santa Clara Co. Hospital, San Jose, Calif.
ODER, Richard Dale	U. of Minnesota	MD 1955	Meadowbrook Hospital, Hempstead, N. Y.
ELICKSON, Alvin S.	U. of Minnesota	MD 1955	Kings Co. Hospital, Brooklyn, N. Y.
INN, Charles W.	U. of Minnesota	MD 1955	Ancker Hospital, St. Paul, Minn.

Reciprocity Candidates

Name	*School*		*Address*
BYRNE, William Joseph	St. Louis U.	MD 1954	Browerville, Minn.
CAUBLE, Charles Franklin	U. of Arkansas	MD 1949	214 Wesley Temple Bldg., Minneapolis, Minn.
ERICKSON, Raymond Leroy	U. of Oregon	MD 1944	852 Lowry Medical Arts Bldg., St. Paul, Minn.
FISHER, Albert Lee	U. of Wisconsin	MD 1950	Veterans' Adm. Hosp., Minneapolis, Minn.
HERRMAN, John Clinton	Jefferson Med. Coll.	MD 1953	200 1st St., S.W., Rochester, Minn.
INDECK, Walter	U. of Illinois	MD 1947	4959 Excelsior Blvd., Minneapolis, Minn.
KIOLBASA, Edward Benedict	U. of Nebraska	MD 1954	105 S. Main St., Stillwater, Minn.
PECK, Willard Raymond	U. of Nebraska	MD 1941	214 Wesley Temple Bldg., Minneapolis, Minn.
PETERSON, Alvin Charles	U. of Nebraska	MD 1953	125 W. Union St., Mora, Minn.
PHILLIPS, William McLeskey	U. of Tennessee	MD 1952	200 1st St., S.W., Rochester, Minn.
SULLIVAN, JR., William Albert	Tulane U.	MD 1947	U. of Minn. Hospitals, Minneapolis, Minn.
WATKINS, Charles William	St. Louis U., Mo.	MD 1951	200 1st St., S.W., Rochester, Minn.
WOOD, Matthew William	U. of Tennessee	MD 1950	200 1st St., S.W., Rochester, Minn.

National Board Candidates

Name	*School*		*Address*
ALPERT, Abraham Edward	Creighton U.	MD 1949	Memorial Hospital, Virginia, Minn.
EFTELAND, Myles Elroy	Northwestern U.	MD 1954	Karlstad, Minn.
FIFER, Ellen Zinsser	Columbia U.	MD 1949	Student Health, U. of Minn, Minneapolis, Minn.
GLENCHUR, Harry	U. of Rochester	MD 1953	Veterans' Adm. Hosp., Minneapolis, Minn.
KRISTENSEN, Lowell Andrew	Yale U.	MD 1954	Chetek, Wis.
MOWLEM, Albert	Yale U.	MD 1951	U. of Minn. Hospitals, Minneapolis, Minn.
SASANO, JR., Joseph Richard	Georgetown U.	MD 1954	1843 Lurting Ave., N. Y., N. Y.
SIMENSTAD, John Otis	Johns Hopkins	MD 1954	Osceola, Wis.
TSUJI, Harold Kazuyoshi	Temple U.	MD 1952	517 Maple Lane, Edgsworth, Sewickly, Pa.

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

PHYSICIANS LICENSED NOVEMBER 4, 1955

Name	*School*			*Address*
ANDERSON, Charles Clyde	U. of Illinois	MD	1954	968 40th St., Moline, Ill.
BOUCHER, Donald Lester	U. of Minnesota	MD	1953	2841 44th Ave. S., Minneapolis, Minn.
BUCK, Conrad Charles LeRoy	U. of West. Ontario	MD	1952	200 1st St., S.W., Rochester, Minn.
DEGALLIER, Daniel	U. of Lausanne, Switzerland	MD	1951	Mpls. Gen. Hospital, Minneapolis, Minn
DUNITZ, Norman	State U. of Iowa	MD	1953	200 1st St., S.W., Rochester, Minn.
EITZMAN, Donald Vern	U. of Iowa	MD	1954	U. of Minn. Hospitals, Minneapolis, Mi
FAILOR, Harlan John	U. of Wisconsin	MD	1954	200 1st St., S.W., Rochester, Minn.
FEDDERS, Skaidrite	U. of Latvia	"Physician"	1940	U. of Minn. Hospitals, Minneapolis, Mi
FOERSTER, Darryl Kemp	U. of Toronto	MD	1951	200 1st St., S.W., Rochester, Minn.
FROST, Donald Morgan	Northwestern U.	MD	1955	Miller Hospital, St. Paul, Minn.
GREEN, Leland James	U. of Minnesota	MD	1955	Mt. Sinai Hospital, Minneapolis, Minn.
HASSEL, JR., Carl Walter	Jefferson Med. Coll.	MD	1954	200 1st St., S.W., Rochester, Minn.
JOHNSON, Paul Einar	U. of Minnesota	MD	1955	St. Mary's Hospital, Duluth, Minn.
LEHOUX, Louis Marie	Laval U.	MD	1953	200 1st St., S.W., Rochester, Minn.
MACH, John Richard	Marquette U.	MD	1955	St. Mary's Hospital, Minneapolis, Minn.
McCLARY, JR., Geo. Brewer	Northwestern U.	MD	1953	200 1st St., S.W., Rochester, Minn.
McRAE, Laird Donald	Northwestern U.	MD	1955	St. Mary's Hospital, Duluth, Minn.
O'ROURKE, William James	Creighton U.	MD	1955	St. Mary's Hospital, Duluth, Minn.
PETERS, Edward Hilliard	Northwestern U.	MD	1955	St. Mary's Hospital, Duluth, Minn.
STERN, Marvin Lee	U. of Manitoba	MD	1955	Mt. Sinai Hospital, Minneapolis, Minn.
TRAPNELL, Richard Henry	U. of Pennsylvania	MD	1952	200 1st St., S.W., Rochester, Minn.
VINES, Benjamin Glenn	Howard U.	MD	1954	Veterans' Adm. Hosp., Minneapolis, Mi
WESTMAN, Lincoln Herbert	U. of Wisconsin	MD	1953	200 1st St., S.W., Rochester, Minn.
WHITE, Robert Joseph	Harvard U.	MD	1953	200 1st St., S.W., Rochester, Minn.

Reciprocity Candidates

Name	*School*			*Address*
ANDERSON, Arden Oris	U. of Washington	MD	1954	Iron Exchange Bldg., Brainerd, Minn.
BORMAN, John Otto	Jefferson Med. Coll.	MD	1951	U. of Minn. Hospitals, Minneapolis, Mi
COURTRIGHT, Claiborne Lee	U. of Oklahoma	MD	1951	200 1st St., S.W., Rochester, Minn.
ENGEL, Stephen	U. of Texas	MD	1954	200 1st St., S.W., Rochester, Minn.
FLATT, John R.	Northwestern U.	MD	1953	Community Clinic, Wabasha, Minn.
HARP, Robert Allen	U. of Texas	MD	1954	200 1st St., S.W., Rochester, Minn.
HATLEBERG, James Larrabee	Marquette U.	MD	1953	U. of Minn. Hospitals, Minneapolis, Min
HOLLAND, Robert Hughes	Jefferson Med. Coll.	MD	1944	Veterans' Adm. Hospital, Dallas, Texas
HAZLEDINE, Herbert John	U. of Michigan	MD	1943	200 1st St., S.W., Rochester, Minn.
HOWLAND, JR., Willard J.	U. of Kansas	MD	1950	200 1st St., S.W., Rochester, Minn.
McDONNELL, Thomas Richard	Creighton U.	MD	1944	200 1st St., S.W., Rochester, Minn.
MOLLISON, Malcolm	U. of Oklahoma	MD	1946	1101 E. Pecan, Altus, Okla.
NEWNUM, Raymond Lavern	Indiana U.	MD	1951	200 1st St., S.W., Rochester, Minn.
PETSCH, Kenneth Ray	Wash. U. (Mo.)	MD	1945	45 N. Snelling Ave., St. Paul, Minn.
PLOTT, Carol LeVan	U. of Virginia	MD	1943	Heron Lake, Minn.
POLLOCK, JR., Anthony J.	Marquette U.	MD	1948	Vet. Adm. Regional Office, Minneapol Minn.
PROUD, Harry Stewart	U. of Oregon	MD	1950	No. Pacific Beneficial Hospital, St. Pa Minn.
ROSS, Griff Terry	U. of Texas	MD	1945	200 1st St., S.W., Rochester, Minn.
SCOTT-MILLER, James Robert	U. of Nebraska	MD	1954	200 1st St., S.W., Rochester, Minn.
SMITH, William Randolph	U. of Tennessee	MD	1950	200 1st St., S.W., Rochester, Minn.
STEEL, Helen Jean	U. of Texas -	MD	1954	200 1st St., S.W., Rochester, Minn.
THEYE, Richard Albert	Indiana U.	MD	1948	200 1st St., S.W., Rochester, Minn.
VIDAL-GILET, Jose H.	U. of Arkansas	MD	1949	U. of Minn. Hospitals, Minneapolis, Min
WILBUR, Ronald Eugene	U. of Kansas	MD	1946	200 1st St., S.W., Rochester, Minn.
YOSS, Robert Eugene	U. of Tennessee	MD	1948	200 1st St., S.W., Rochester, Minn.

National Board Candidates

Name	*School*			*Address*
COTTONE, Francis John	Georgetown U.	MD	1954	200 1st St., S.W., Rochester, Minn.
FRANTZ, JR., Ivan De Ray	Harvard U.	MD	1941	U. of Minn. Hospitals, Minneapolis, Min
GLICK, Dallas Donald	U. of Chicago	MD	1954	200 1st St., S.W., Rochester, Minn.
GREENSPAN, Richard Henry	Syracuse U.	MD	1948	U. of Minn. Hospitals, Minneapolis, Min
HAYNES, JR., Vital E.	Creighton U.	MD	1952	200 1st St., S.W., Rochester, Minn.
HOFFMAN, David Leland	Cornell U.	MD	1945	200 1st St., S.W., Rochester, Minn.
HUNTER, Samuel Joseph	Yale U.	MD	1954	200 1st St., S.W., Rochester, Minn.
LEONARD, John Paul	Albany Med. Coll.	MD	1954	Veterans Adm. Hospital, Minneapolis, Min
MARQUIS, John William	Geo. Wash. U.	MD	1954	200 1st St., S.W., Rochester, Minn.
MARTIN, Maurice John	U. of Illinois	MD	1954	200 1st St., S.W., Rochester, Minn.
MAYER, Richard Frederick	U. of Buffalo	MD	1954	200 1st St., S.W., Rochester, Minn.
MINOR, Ralph Hugh	U. of Washington	MD	1954	200 1st St., S.W., Rochester, Minn.

ame	School		Address
ORMAN, JR., Warren L.	Med. Coll. Va.	MD 1943	200 1st St., S.W., Rochester, Minn.
RRELL, Frank	Columbia U.	MD 1951	U. of Minn. Hospitals, Minneapolis, Minn.
MSDELL, John Alan	Columbia U.	MD 1954	200 1st St., S.W., Rochester, Minn.
SENDORF, Stanley Bernard	Geo. Wash. U.	MD 1953	416 Florida Ave., NE., Wash., D. C.
ORMONT, James Russell	Geo. Wash. U.	MD 1954	200 1st St., S.W., Rochester, Minn.
NCE, John William	U. of West Ontario	MD 1951	200 1st St., S.W., Rochester, Minn.
LSH, John Joseph	N. Y. Med. Col.	MD 1953	200 1st St., S.W., Rochester, Minn.
ODWARD, JR., Edward	Med. Col. Va.	MD 1951	200 1st St., S.W., Rochester, Minn.
NEHIRO, Earl Grant	U. of Rochester	MD 1952	U. of Minn. Hospitals, Minneapolis, Minn.
UKER, James Edward	U. of Buffalo	MD 1954	U. of Minn. Hospitals, Minneapolis, Minn.
EGLER, Dewey Kiper	Harvard U.	MD 1945	U. of Minn. Hospitals, Minneapolis, Minn.

YSICIAN'S LICENSE REVOKED FOLLOWING ABORTION CONVICTION

: Revocation of the License of William L. Minkowski, M.D.

On February 10, 1956, the Minnesota State Board Medical Examiners revoked the medical license ld by Dr. William L. Minkowski of Redwood City, lifornia. Dr. Minkowski, who did not appear at the aring on that date, had been charged in a citation is- ed by the Board with having been convicted of two fel- ies in the Superior Court of San Mateo County, Cali- nia. The citation charged Dr. Minkowski with having en convicted on or about April 26, 1954, of the crimes abortion and conspiracy to commit abortion. A certi- d copy of the proceedings of the Superior Court dis- oses that Dr. Minkowski was sentenced to a term of one ar in the county jail of San Mateo County on each the two charges, the sentences to run concurrently. he sentence also provided that in addition to serving e one-year term, Dr. Minkowski was to be on proba- on for two years.

Dr. Minkowski, who was born in Mt. Vernon, New ork, on February 20, 1917, graduated from the Uni- rsity of Minnesota with an M.D. degree on December , 1943. He served an internship at Philadelphia eneral Hospital and then took postgraduate work at eth Israel Hospital, New York City, from July, 1946, June, 1947. Dr. Minkowski was licensed in Minne- ta by examination on February 7, 1947.

MINNEAPOLIS QUACK SENTENCED FOR ILLEGAL HEALING

e: State of Minnesota vs. Davis Stern, also known as David Stern and "Doc" Stern.

On May 22, 1956, Davis Stern, sixty-eight, a resident the Sheridan Hotel, Minneapolis, entered a plea of uilty before the Hon. Harold N. Rogers, Judge of the istrict Court of Hennepin County, to an information harging him with practicing healing without having a ertificate of registration in the basic sciences, whereupon udge Rogers sentenced the defendant to a term of ne year in the Hennepin County Jail. Judge Rogers ayed the execution of the sentence for a period of one ear to allow Stern to return to the State of New ork and he was ordered to turn over his medical ooks and instruments to Minneapolis General Hospital. he sentence was suspended on the further condition hat Stern is to refrain from practicing healing in any orm in any state and also from giving medical advice. tern was charged with illegally practicing healing after t was learned that he had examined a Minneapolis nan and diagnosed his case as high blood pressure, naking a total charge of $12.95 for two types of medi- ine which he furnished to the patient.

When questioned by the Court, the defendant stated hat he was born on September 17, 1887, in New York ity, and although he admitted that he had never graduated from a medical school, Stern claimed that he had taken courses at a medical school in New York City in 1907. Stern admitted that he had various medical instruments in his room at his hotel and that he had seen patients there, but he denied having charged patients for diagnosis or treatment. When he was asked how he was able to live without making charges, the defendant replied that he received $98.50 per month in the form of a pension and also two $25.00 checks each month "from friends." Stern holds no license to practice any form of healing in Minnesota.

GRANITE FALLS "REFLEXOLOGIST" SENTENCED FOR ILLEGAL HEALING

Re: State of Minnesota vs. Percy Graham

On May 28, 1956, Percy Graham, sixty-six, Granite Falls, Minnesota, entered a plea of guilty before the Hon. C. A. Rolloff, Judge of the District Court at Olivia, Minnesota, to an information charging him with practicing healing without having a certificate of registration in the basic sciences and Judge Rolloff then sentenced Graham to serve one year in the County Jail of Chippewa County, which was the county in which the offense occurred. The execution of the sentence was stayed by the Court, however, and the defendant was placed on probation for one year on condition that he obeys all laws and the rules and regulations prescribed in connection with his probation.

After it was reported to the Minnesota State Board of Medical Examiners that Graham was engaged in healing activities, a representative of the Board investigated the matter and learned that a forty-two-year-old woman patient, who was hospitalized at the Granite Falls Municipal Hospital under the care of a doctor of medicine, had previously been taking treatments from the defendant for her condition. Graham made a charge of $2.50 for each visit to the patient and in addition was paid the sum of $60.00 for a "foot bath." According to the patient, Graham twisted her toes, rubbed her hands, legs, back, spine and head with his hands and at other times he rubbed her with one hand while he held an electric vibrator in the other hand. She also said that Graham advised her not to eat toast or oatmeal because it had charcoal in it.

While being questioned prior to being sentenced in court, Graham stated that he was born at Bird Island, Minnesota, on May 14, 1890, and that his education consisted of grade school and three years of high school. The defendant, who admitted that he was not licensed to practice any form of healing in any state, referred to his work as "reflexology." He claimed that he had taken one four-day course in this subject in Sioux Falls, South Dakota, in 1954 and another similar course in 1955. In describing "reflexology" Graham said that the nerve endings in the toes of the feet connect with the various organs of the body and therefore these organs are stimulated when those nerve endings are massaged. Graham admitted that he usually charged the patient from $2.50 to $3.00 per treatment.

Meetings and Announcements

MEDICAL MEETINGS

State

Minnesota Society of Obstetrics and Gynecology, fall meeting, Rochester, Minnesota, September 22. Dr. Edward A. Banner, secretary, Rochester, Minnesota.

National

American Association of Blood Banks, ninth annual meeting, Somerset Hotel, Boston, Massachusetts, September 3-5. Secretary Marjorie Saunders, 725 Doctors Building, 3707 Gaston Ave., Dallas, Texas.

American Heart Association, 29th annual scientific session, Cincinnati, Ohio, October 26-29. Write American Heart Association, 44 East 23rd Street, New York 10, New York.

Minnesota-Dakota-Manitoba Orthopedic Society, annual meeting, Red Wing, Minnesota, September 7 and 8. Dr. Hollis Ahlrin, secretary, Rapid City, South Dakota.

National Society for Crippled Children and Adults, annual convention, Hotel Statler, Washington, D. C., October 28-31.

Postgraduate Medical School of New York University—Bellevue Medical Center, eight-week course in occupational medicine, September 10-November 2. Write Dean, N.Y.U. Postgraduate Medical School, New York 16, New York.

University of Illinois Department of Otolaryngology, Annual Assembly in Otolaryngology, October 1-7. Write Department of Otolaryngology, 1853 West Polk Street, Chicago 12, Illinois.

West Virginia State Medical Association, 89th annual meeting, The Greenbrier, White Sulphur Springs, West Virginia, August 23-25.

International

Congress of International Society of Hematology, Hotel Somerset, Boston, Massachusetts, August 27-September 1. Dr. W. C. Moloney, secretary, 39 Bay State Road, Boston, Massachusetts.

European Congress of Cardiology, Stockholm, Sweden, September 10-14. Dr. Karl E. Grewin, secretary, Sodersjukhuset, Stockholm, Sweden.

Inter-American Congress of Cardiology, Havana, Cuba, November 4-10. Dr. Ramon Aixala, Apartado 2108, Havana, Cuba.

Inter-American Conference on Occupational Medic and Toxicology, Miami, Florida, September 3-7. Sp sored by the schools of medicine of University of Mia and University of Havana, Cuba. General chairm Dr. Homer F. Marsh, dean, School of Medicine, U versity of Miami.

International Congress of Clinical Chemistry, Hc New Yorker, New York, September 9-14. Secreta John G. Reinhold, 711 Maloney Building, Univers of Pennsylvania, Philadelphia 4, Pennsylvania.

International Congress of Internal Medicine, Madr Spain, September 19-23. Dr. J. C. DeOya, secreta No. 90, Madrid, Spain.

International Congress of International College Surgeons, Palmer House, Chicago, Illinois, Septem 9-13. Dr. Max Thorek, secretary general, 1516 La Shore Drive, Chicago, Illinois.

International Congress of Radiology, Mexico, D. Mexico, July 22-28. Dr. Jose Noriega, secretary, Te 126 (2 e piso), Mexico, D. F. 7, Mexico.

International Congress on Diseases of the Ch Cologne, Germany, August 19-23. Murray Kornfe executive director, 112 East Chestnut St., Chicago Illinois.

Pan American Congress on Cancer Cytology, Mia Florida, January 8-12, 1957. Dr. J. Ernest Ayre, cha man, 1155 N. W. 14th St., Miami, Florida.

Pan-Pacific Surgical Association, seventh congr Honolulu, Hawaii, November 14-22, 1957. Write I F. J. Pinkerton, director-general of the Pan-Pac Surgical Association, Room 230, Young Building, Ho lulu, Hawaii.

Second World Conference on Medical Educati World Medical Association, Chicago, Illinois, August to September 4, 1959.

World Medical Association, Havana, Cuba, Octo 9-15. Dr. Louis H. Bauer, secretary general, 345 E 46th St., New York 17, New York.

SPECIAL NOTICE

The dates for the 104th annual meeting of the Minnesota State Medical Association have been changed. The meeting, scheduled for St. Paul will be held *May 13, 14 and 15, 1957,* instead of May 20, 21, 22 as previously announced.

TERNATIONAL COLLEGE OF JRGEONS EXAMINATIONS

Examinations for qualified fellows of the International ollege of Surgeons will be held in Chicago, Illinois, ly 23 and 24 and October 29 and 30. Oral conrences will be held on August 6 and October 22. For tails, write Secretary of the Qualifications Council, nternational College of Surgeons, 1516 Lake Shore rive, Chicago 10, Illinois.

MERICAN BOARD OF OBSTETRICS AND YNECOLOGY CERTIFICATION

Of a total of 415 candidates who participated in the art II examinations of the American Board of Obetrics and Gynecology last year, 317 were certified. mong them were the following Minnesota physicians: r. Arthur M. Antonow, Virginia; Dr. Erick Y. Hakanon, St. Paul; Dr. Morris S. Rothnem, Minneapolis; r. Francis M. Swain, Minneapolis, and Dr. Kenneth V. Teich, Duluth.

MERICAN HEART ASSOCIATION CCEPTING APPLICATIONS

Applications by research investigators for support of tudies in or related to the cardiovascular field are now eing accepted by the American Heart Association. The wards would be for the fiscal year beginning July 1, 957. Application deadline for research fellowships and stablished investigatorships is September 15, 1956. For rants-in-aid the application deadline is November 1. urther information and application forms are available rom the Medical Director, American Heart Association, 4 East 23rd Street, New York 10, New York.

MINNESOTA SURGICAL SOCIETY

At a meeting of the Minnesota Surgical Society in Rochester May 11, 1956, the following officers were lected for the coming year:

D. O. Ferris, M.D., Rochester, president; Logan Levin, M.D., St. Paul, vice-president; Owen G. McDonald, M.D., Duluth, secretary-treasurer.

AMERICAN UROLOGICAL ASSOCIATION AWARD

The American Urological Association offers an annual award of $1,000 (first prize of $500, second prize $300 and third prize $200) for essays on the result of some clinical or laboratory research in Urology. Competition shall be limited to urologists who have been graduated not more than ten years, and to hospital internes and residents doing research work in Urology.

The first prize essay will appear on the program of the forthcoming meeting of the American Urological Association, to be held at the Hotel William Penn, Pittsburgh, Pennsylvania, May 6-9, 1957.

For full particulars, write the Executive Secretary, William P. Didusch, 1120 North Charles Street, Baltimore, Maryland. Essays must be in his hands before December 1, 1956.

In Memoriam

EDGAR A. KING

Dr. Edgar A. King, Minneapolis, died June 1, 1956. He was ninety-one years old.

A graduate of Chicago Homeopathic Medical College and of Rush Medical College, he began to practice medicine in 1909. He served as a Captain in the medical corps in World War I and was affiliated with the Health Department of the City of Minneapolis and was on the staffs of both St. Mary's and Northwestern Hospitals in Minneapolis.

Dr. King was a member of the Hennepin County Medical Society, the Minnesota State Medical Association and the American Medical Association.

Survivors include a daughter, Bessie, Minneapolis, and a son, Dr. Zerah P. King, Los Angeles, California.

AUGUST C. TINGDALE

Dr. August C. Tingdale, former superintendent of the Minneapolis workhouse, died June 5, 1956. He was eighty-three years old.

A Minneapolis physician and surgeon for more than fifty years, Dr. Tingdale was born in Norway, graduated from Hamline University Medical School, St. Paul, and studied surgery in Vienna, Austria.

He was on the staff of Deaconess Hospital, was physician for the Ebenezer Home and a member of the Hennepin County Medical Society, the Minnesota State Medical Association and the American Medical Association. He also belonged to the Scottish Rite, Masonic Lodge 224, Zuhrah Temple, Phi Rho Sigma medical fraternity and the Norwegian Lunch Club.

Survivors include a son Randolph, New York; a daughter, Mrs. Owen Heath, St. Louis Park, and four sister, Mrs. Olive Jenson and Mrs. Mary Hanson, St. Louis Park; Mrs. Katherine Marsh, New York, and Mrs. Sigrid Leland, Seattle, Washington.

ROBERT R. TRACHT

Dr. Robert R. Tracht, a member of the University of Minnesota Medical School faculty, died May 25, 1956. He was fifty-six years old.

Dr. Tracht was a clinical assistant professor and refractionist in the department of ophthalmology at the University. He was also a practicing ophthalmologist in St. Paul with offices in the Lowry Medical Arts Building.

A graduate of Whittenberg College, Springfield, Ohio, and of Loyola University Medical School, Chicago, he was a member of the Ramsey County Medical Society, the Minnesota State Medical Association and the American Medical Association. He was also a fellow of the National Academy of Ophthalmology and Otolaryngology.

Survivors include his wife, Ann; two daughters, Sigrid and Catherine, and a son, Robert, all of St. Paul, and a sister, Mrs. Harold Sayles, Cleveland, Ohio.

Woman's Auxiliary

PRESIDENT'S MESSAGE

All of us who are concerned about auxiliary work are happy that every county in the state is now organized. We are freed of concern about forming new auxiliaries and securing members-at-large; we can concentrate on increasing our membership and making each of our thirty-four county units a live and vital organization.

Each auxiliary has specific needs. Small county groups wish to learn more about setting up committees to deal with material sent from state and national offices. Hennepin and Ramsey counties, realizing the need for closer personal relationship among doctors' wives in cities, have initiated neighborhood meetings: a move toward decentralization and informality. The problems are many and varied.

This year we had a membership increase of 221, about 11 per cent. There are 3,406 physicians in the state medical association and 2,182 auxiliary members. That looks as if about 1200 eligible doctors' wives see no merit in joining the auxiliary, but actually the number is closer to 700. There are groups of doctors whose wives would not likely be members: men in the armed services, men in residencies or fellowships, and the associate, affiliate, and life members. Several counties have 100 per cent membership and we congratulate them. We will continue to try for a 10 per cent increase in membership next year.

Regional meetings were held at Hibbing, Jackson, and Rochester. These meetings serve an excellent purpose in allowing neighboring auxiliaries to get better acquainted and discuss auxiliary affairs informally.

Good auxiliary work depends on close relations between the state board and county units. The county president is a member of the state board and is directly responsible for bringing to her auxiliary the directives of the state board. It is imperative that she or her delegate be present at board meetings. This relationship is the basis of the entire auxiliary organization. Board meetings and regional meetings are our channels for relaying information to the county and the individual.

Mrs. C. L. Oppegaard and I shall attend the conference for presidents and presidents-elect in Chicago, October 1-3. Our own Minnesota school of instruction will be held at the Curtis Hotel, Minneapolis, on October 9. All auxiliary members are welcome and all committee chairmen should be present for instruction and reports from the Chicago meeting. Attendance at this fall meeting is a MUST for committee chairmen and county presidents.

MRS. L. P. HOWELL
President

OFFICERS AND COMMITTEE CHAIRMEN 1956-1957

Officers

President—Mrs. L. P. Howell, Rochester
President-Elect—Mrs. C. L. Oppegaard, Crookston
First Vice President—Mrs. Reuben Erickson, Minneap
Second Vice President—Mrs. M. F. Fellows, Duluth
Third Vice President—Mrs. Wallace Ritchie, St. Paul
Fourth Vice President—Mrs. R. H. Wilson, Winona
Recording Secretary—Mrs. E. R. Hudec, Echo
Corresponding Secretary—Mrs. John M. Waugh, Ro ester
Treasurer—Mrs. W. B. Stromme, Minneapolis
Auditor—Mrs. George Penn, Mankato
Historian—Mrs. H. E. Bakkila, Duluth
Parliamentarian—Mrs. Leo W. Fink, Minneapolis

Regional Advisors

First District—Mrs. Howard F. Polley, Rochester
Second District—Mrs. David Halpern, Brewster
Third District—Mrs. M. I. Hauge, Clarkfield
Fourth District—Mrs. Alton E. Lindblom, Mankato
Fifth District—Mrs. Harold Peterson, St. Paul
Sixth District—Mrs. L. Raymond Scherer, Minneap
Seventh District—Mrs. Leslie Evans, Sauk Rapids
Eighth District—Mrs. Robert Estrem, Fergus Falls
Ninth District—Mrs. Andrew Sinamark, Hibbing

Committee Chairmen

Standing Committees

Allied Medical Careers—Mrs. E. H. Soule, Roches

A.M.E.F.—Mrs. W. E. Wellman, Rochester

Archives—Mrs. James L. Benepe, St. Paul

Bulletin—Mrs. Ralph Eckman, Duluth

Cancer—Mrs. John Cameron, Crookston

Editor (MINNESOTA MEDICINE)—Mrs. A. B. Rosenfiel Minneapolis

Finance—Mrs. Mark Ryan, St. Paul

Health Days—Mrs. Conrad Karleen, Minneapolis

Legislation—Mrs. W. P. Gardner, St. Paul

Medical and Surgical Relief—Mrs. W. T. Greenfiel Cokato

Newsletter: The Gopher Doctor's Wife—Mrs. C. Carlson, Alexandria

Organization—Mrs. C. L. Oppegaard, Crookston

Press and Publicity—Mrs. Leonard Arling, Minneapo

Printing and Roster—Mrs. L. R. Boies, Hopkins

Program and Health Education—Mrs. Philip Ar St. Paul

Public Relations—Mrs. M. O. Wallace, Duluth

Resolutions—Mrs. W. A. Merritt, Rochester
Revisions—Mrs. Harold Wahlquist, Minneapolis
School of Instruction—Mrs. Karl Anderson, Excels
Today's Health—Mrs. H. P. Van Cleve, Austin

Special Committees

Civil Defense—Mrs. J. A. Cosgriff, Olivia
In Memoriam—Mrs. Charles Waas, St. Paul
Mental Health—Mrs. William Gjerde, Lake City

General Interest

Minnesota physicians are invited to submit items of "eneral interest" concerning themselves or their col- gues to Minnesota Medicine, 2642 University Avenue, Paul 14, Minnesota. Only the facts are needed—o? what? where? when? why?—since items will be written for uniformity of style.

* * *

Dr. **James Rogers Fox**, Minneapolis, is the new presi- nt of the Minnesota Academy of Occupational Medi- ne. Other officers of the group include **Dr. Tracy rber**, Austin, recorder; **Dr. Orley Foster**, Minnea- lis, vice president; **Dr. John Williams**, St. Paul, cretary, and **Dr. Robert Goltz**, Minneapolis, treasurer.

* * *

Dr. **LeRoy W. Hanson** has discontinued his practice Pelican Rapids, where he was located for the past ur years. On July 1 he began a residency in ortho- edics at the Baylor University School of Medicine, ouston, Texas.

* * *

Dr. **M. Duane Sommerness**, clinical director of the ergus Falls State Hospital, was a principal speaker at recent meeting of the Advisory Committee of Judges f Probate to the Department of Public Welfare. The eeting was held at the hospital in Fergus Falls on ay 2.

* * *

At the annual meeting of the Minnesota Licensed ractical Nurses Association in St. Paul on May 15, the rincipal speaker was **Dr. John H. Moe**, Minneapolis, who discussed scoliosis.

* * *

Dr. **W. Z. Flower**, former practitioner at Gibbon until his retirement nine years ago, celebrated his ninety-ifth birthday at the Good Samaritan Home in Gaylord on May 23. Dr. Flower began practice at Gibbon in 1890, moved from there in 1921, practiced in California and in Minneapolis before returning to Gibbon in 1941. He retired from active practice in 1947.

* * *

Twenty-three Minnesota physicians were honored at the annual banquet of the Minnesota State Medical Association in Rochester on May 22 for completing fifty years of medical practice. The new additions to the association's "50 Club" were **Dr. John F. Hendrickson**, **Dr. Gilbert Doxey**, **Dr. E. L. Meyer** and **Dr. Frederick C. Rodda**, all of Minneapolis; **Dr. Robert Burns**, **Dr. Harold J. Rothschild**, **Dr. O. W. Holcomb**, **Dr. Andrew W. Hilger** and **Dr. E. T. F. Richards**, all of St. Paul; **Dr. Samuel J. Hillis**, East Bradenton, Florida, and **Dr. H. G. Collie**, St. Petersburg, Florida, both formerly of St. Paul; **Dr. Edward Tuohy**, Santa Barbara, California, formerly of Duluth; **Dr. Winslow C. Chambers**, Blue Earth; **Dr. Arthur W. Ide**, White Bear Lake; **Dr. A. W. Graham**, Chisholm; **Dr. J. W. Helland**, Spring Grove; **Dr. Johannes C. Jacobs**, Willmar; **Dr. Herman Linde**, Cyrus; **Dr. Henry E. Nelson**, Crookston; **Dr. O. M. Porter**, Atwater; **Dr. L. L. Sogge**, Windom; **Dr. J. D. Waller**, Pine City, and **Dr. Alexander M. Watson**, Royalton.

* * *

Dr. **Howard L. Horns**, Minneapolis, has been appointed by Governor Orville Freeman to the Minnesota State Board of Medical Examiners. Dr. Horns replaces **Dr. Ivar Sivertsen**, Minneapolis, who resigned.

* * *

After thirty-four years of practice at Chatfield, **Dr. T. A. Clifton** has moved to a new home at Hollywood, Florida. He and Mrs. Clifton left Chatfield on May 10.

* * *

Dr. **O. S. Kulstad**, Dodge Center, was the winner of a share of stock in the Ford Motor Company at the annual meeting of the Minnesota State Medical Association in Rochester. The stock was a registration prize at the booth operated by Jamieson and Company, Minneapolis.

* * *

Among Macalester College alumni cited for community service at an alumni dinner in the Twin Cities on May 26 was **Dr. Carl R. Wall**, Minneapolis.

* * *

Dr. **Richard C. Horns**, clinical assistant professor of ophthalmology at the University of Minnesota, spoke before the Eye, Ear, Nose and Throat Section of the combined North and South Dakota State Medical Societies meeting in Aberdeen, South Dakota, on June 4. Dr. Horn's topic was "Surgical Treatment of Blepharoptosis."

* * *

Dr. **Thomas J. Dry**, head of a section of medicine in the Mayo Clinic and professor of medicine in the Mayo Foundation, is leaving Rochester this month for Capetown, Union of South Africa, where he will enter private practice. Dr. Dry, who was born and educated in the Union of South Africa, has been at Rochester since 1931.

* * *

Dr. **Gordon R. Kamman**, St. Paul, attended the annual meeting of the American Board of Legal Medicine at the Edgewater Beach Hotel in Chicago, Illinois, on June 9 and 10.

* * *

At a joint meeting of Range and county medical societies at the Mesaba Country Club in Hibbing on June 13, the principal speaker was **Dr. John W. LaBree**, Minneapolis, who discussed "Heart Disease Amenable to Surgery."

* * *

Dr. **Harold E. Miller**, Edina (Minneapolis suburb), is the new president of the medical staff at Northwestern Hospital, Minneapolis, succeeding **Dr. A. A. Zierold**. Elected as vice president is **Dr. Richard E. Reiley**, with **Dr. Albert J. Schroeder** as secretary-treasurer.

Dr. S. Marx White, Minneapolis, was presented with the second annual F. E. Harrington award of the Minneapolis Junior Chamber of Commerce at the annual dinner of the Upper Midwest Hospital Conference in Minneapolis on May 25. The award was for Dr. White's outstanding service to public health.

* * *

Dr. Mary L. McElwee, Rochester, a fellow in surgery in the Mayo Foundation since 1953, has been named staff physician in the Oberlin College Health Service, Oberlin, Ohio.

* * *

Dr. S. W. Giere, Benson, left on May 30 for a three-month trip to Europe, where he will tour Ireland, Scotland, Denmark, Sweden and Norway. He expects to return to Benson late in August.

* * *

Bethel College and Seminary, at graduation ceremonies on May 25, honored **Dr. Carl G. Burton**, St. Paul, for his services to the school. Dr. Burton has been chairman of the school's board for thirteen years.

* * *

Dr. Milton L. Kaiser, New Ulm, was principal speaker at the first of a series of parenthood classes at Union Hospital in New Ulm on May 21.

* * *

A brief biographical sketch of **Dr. William B. Roberts**, Minneapolis, was featured in the Town Toppers column of the *Minneapolis Star* on May 11. Now in his eighty-first year, Dr. Roberts is "half-retired."

* * *

Dr. Henry W. Goehrs, St. Cloud, presided over a meeting of the Great Northern Railway Surgeons Association in Winnipeg, Canada, on May 28 and 29.

* * *

Principal speaker at the Cap and Gown Day convocation at the University of Minnesota on May 24 was **Dr. Irvine McQuarrie**, former head of the university's pediatrics department, who retired from the faculty in June after twenty-six years of service. Dr. McQuarrie will teach and continue his research work at the University of Hawaii.

* * *

Dr. Samuel F. Haines, Rochester, has been presented with a certificate for meritorious service by the American Goiter Association.

* * *

Dr. Carl W. Waldron, Hopkins (Minneapolis suburb), has been appointed to the committee on health and special weapons of the U. S. Civil Defense Council.

* * *

Dr. Merrill D. Chesler, Minneapolis, was the principal speaker at a meeting of the Third District Nurses Association, held as part of a Civil Defense program at Minneapolis General Hospital on June 18. He presented an illustrated talk on "The Treatment of Burns."

* * *

Dr. John F. Briggs, St. Paul, has been elected chairman of the board of regents of the American College of Chest Physicians. **Dr. Herman J. Moersch**, Rochester, has been elected president of the organization.

NEW LOCATIONS

Dr. John W. Anderson has joined **Dr. Don V. Smit** and **Dr. George W. Drexler** at the recently remodele Blue Earth Medical Center, Blue Earth. Dr. Anderso formerly practiced at Sidney, Montana.

* * *

Dr. Richard C. Horns, whose practice is limited t ophthalmology, has moved his offices to 1137 Medica Arts Building, Minneapolis (FEderal 6-5789).

* * *

Dr. Ervin A. Kjenaas, who recently completed a tou of duty in the Army, has joined the staff of the Hasting State Hospital, Hastings.

* * *

Dr. Lauri E. Koskela, formerly of Cleveland, Ohio has opened offices for the practice of medicine i Carlton.

* * *

Dr. Whitney Woodruff, formerly of Manhasset, Ne York, has joined the staff of the East Range Clin at Virginia.

* * *

Dr. John W. Docksey, formerly assistant chief surgeo at the Veterans Administration Hospital in Wood, Wis consin, has become associated with the staff of th Willmar Clinic, Willmar.

* * *

Dr. Albertus F. Dodson, who previously practice at Hastings, Nebraska, has become associated with Dr **Bernard J. Hughes** and **Dr. John B. O'Leary** in th North Central Medical Clinic, Brainerd.

MINNESOTA BLUE CROSS-BLUE SHIELD

Nearly 1,044,000 Minnesotans are now enrolled i Blue Cross as of April 30, 1956. Enrollment in Blu Cross has shown a steady increase during the first fou months of 1956. From January to April, 1956, th number of Blue Cross effective contracts has increase from 391,193 to 394,056.

During the first four months of 1956, Blue Cros provided over 374,000 days of hospital care for 60,42 subscribers. The major reason for hospitalization durin this period has been respiratory illnesses. Over 10,00 cases representing $825,000 in benefits were paid in th category. Maternity care was second—over 9,400 case including nearly 7,700 actual deliveries representing ove $1,100,000 in benefits. Third high in number of cas was digestive diseases—over 8,700 cases and near $1,400,000 were provided in benefits.

Blue Cross benefits totaled over $7,700,000 duri the first four months of 1956.

Dr. Richard R. Cranmer of Minneapolis was electe President of Minnesota Blue Shield at the ninth annu meeting of the Board of Directors at Rochester, Minne sota, on May 21, 1956. Dr. Cranmer has a broad back

(Continued on Page A-32)

A RESEARCH MILESTONE

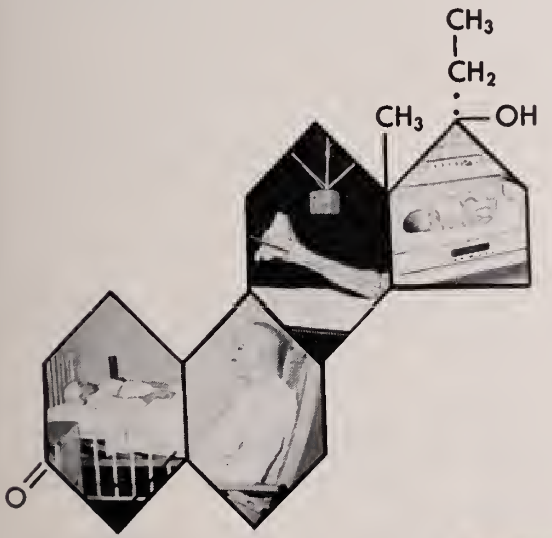
Nilevar*

(BRAND OF NORETHANDROLONE)

Searle's New and Practical Steroid Specifically for Protein Anabolism–

It has long been recognized that a substance which would promote protein anabolism would be of inestimable value in therapy. The androgens have this property, but unfortunately they also exert actions on secondary sex characteristics. These effects are commonly undesirable in therapeutic programs.

THE FIRST STEROID WITH ANABOLIC SPECIFICITY—Nilevar, the newest Searle Research development, therefore, meets a long desired clinical need because Nilevar presents the first steroid primarily anabolic for protein synthesis. Moreover, Nilevar is without prominent androgenic effects (only about one-sixteenth of that exerted by the androgens).



OBJECTIVE AND SUBJECTIVE RESPONSE — Orally effective, Nilevar therapy is characterized by retention of nitrogen, potassium, phosphorus and other electrolytes in ratios indicative of protein anabolism. Moreover, subjectively the patient observes an increase in appetite and sense of well-being.

WELL TOLERATED—Nilevar has an extremely low toxicity. Laboratory animals fail to show toxic effects after six months of continuous administration of high dosages. Nilevar should not be administered to patients with prostatic carcinoma. Nausea or edema may be encountered infrequently. Slight androgenicity may be evidenced on high dosage or in particularly responsive individuals.

MAJOR INDICATIONS—Preparation for and recovery from surgery; supportive treatment of serious illnesses (pneumonia, poliomyelitis, carcinomatosis, tuberculosis); recovery from severe trauma and burns; decubitus ulcers; care of premature infants.

DOSAGE—The daily *adult* dose is three to five Nilevar tablets (30 to 50 mg.) but up to 100 mg. may be administered. For *children* the average daily dose is 1 to 1.5 mg. per kilogram of body weight; individual dosages depend on need and response to therapy.

SUPPLY—Nilevar is available in uncoated, unscored tablets of 10 mg. G. D. Searle & Co., Research in the Service of Medicine.

*Trademark of G. D. Searle & Co.

SEARLE

CAL-ZO

. . . still the best all-purpose dressing ointment

ULMER

ULMER
CAL-ZO
CALZO DRESSING OINTMENT
ULMER PHARMACAL COMPANY

CAL-ZO (Ulmer), originally prepared as the most suitable dressing ointment for pressure-sponge ambulatory treatment of varicose ulcers, continues as the ointment of choice for dressings of every nature. CAL-ZO is ideal whenever calamine and zinc oxide are indicated.

CAL-ZO provides a semi-fluid cushion at body temperature thus protecting lesions under treatment. Contact between gauze threads and seeping surfaces of the healing lesion is prevented. CAL-ZO, because of its special base, will not soak into dressing at body temperatures. Easy to apply, CAL-ZO is the choice of the clinician when all-purpose dressing ointments are considered. Available in 1 oz. or 1¼ lb. jars. MM-756.

The Ulmer Pharmacal Company
1400 Harmon Place • Minneapolis 3, Minn.

(Continued from Page 508)

ground in Blue Shield affairs. He was a membe f the organizing committee which planned the deve - ment and incorporation of Minnesota Blue Shield a since its organization in 1947, he has continuo y served as its Vice President. For two years he was al member of the Blue Shield Commission, the nati organization of Blue Shield Plans.

Dr. O. I. Sohlberg of St. Paul, having served w distinction as President of Minnesota Blue Shield s e its incorporation in 1947, was elected Vice Presiden t the same meeting. In deference to his wishes, ano r member of the Board of Directors was elected as P - dent. Dr. Sohlberg, like Dr. Cranmer, has b n identified with and interested in pre-payment med l care programs even before Minnesota Blue Shield s organized. His experience and sound judgment in e problems encountered by Blue Shield have been resp - sible for his successful leadership as its President.

At the same meeting, Dr. C. A. McKinlay of Mi - apolis and Dr. E. Covell Bayley of Lake City were elected Secretary and Treasurer of Minnesota B e Shield, respectively.

During the annual meeting of the Minnesota S e Medical Association, more physicians called at the B e Shield-Blue Cross exhibit booth and the interest t y showed in Blue Shield matters was greater than at y previous exhibit.

GYNECOLOGIC CYTOLOGY SERVICE
Interpretation of Cervico-Vaginal, Etc.
(Papanicolaou) Smears
for the
Diagnosis of Carcinoma
Kits (Slides, Spatulas, Fixative and Mailing Containers)
and
Instructions for Taking and Mailing Smears furnished on request

M. WM. RUBENSTEIN, M.D.
GYNE-CYTOLOGY LABORATORY
636 Church Street, Room 517 Evanston, Illinois

RADIUM RENTAL SERVICE
4340 CEDARWOOD ROAD
MINNEAPOLIS 5, MINNESOTA
TEL. FE 3-5297

Radium element prepared in type of applicator requested

ORDER BY TELEPHONE OR MAIL
PRICES ON REQUEST

Book Reviews

Books listed here become the property of the Ramsey, Hennepin and St. Louis County Medical Libraries when reviewed. Members, however, are urged to write reviews of any or every recent book which may be of interest to physicians.

BOOKS RECEIVED FOR REVIEW

TEXTBOOK OF PATHOLOGY—8th Edition. E. T. Bell, M.D., Emeritus Professor of Pathology in the University of Minnesota, Minneapolis; Contributors, B. J. Clawson, M.D., Emeritus Professor of Pathology, University of Minnesota, and J. S. McCartney, M.D., Professor of Pathology, University of Minnesota. 1028 pages. Illus. Price $14.50, cloth. Philadelphia: Lea & Febiger, 1956.

RAITE' de TECHNIQUE CHIRURGICALE. B. Fey, P. Macquot, S. Oberlin, J. Quénu, and others. 760 pages. Illus. Price 5,500 fr. Paris: Masson et Cie. Editeurs, 1956.

OCTOR'S MARITAL GUIDE FOR PATIENTS. (Regular and Catholic Editions.) Bernard R. Greenblat, B.S., M.D. Associate Attending, King's County Hospital, Brooklyn, N. Y.; Clinical Instructor Obstetrics and Gynecology, University of the State of New York School of Medicine, etc., 88 pages. Illus. Price $1.50, paper cover. Chicago: Budlong Press, 1956.

ERSONAL HEALTH RECORD. Carl A. Dragstedt, M.D., Ph.D. Northwestern University Medical School. 64 pages. Price $1.00, paper cover. Harrisburg, Pennsylvania: Military Service Publishing Company, 1956.

GLYCAMINE®
TABLETS

For Peptic Ulcers and Hyperacidity

Available All Drug Stores

Distributed by
DALCO PHARMACAL CO.
Minneapolis, Minnesota

UNUSUAL LENS GRINDING

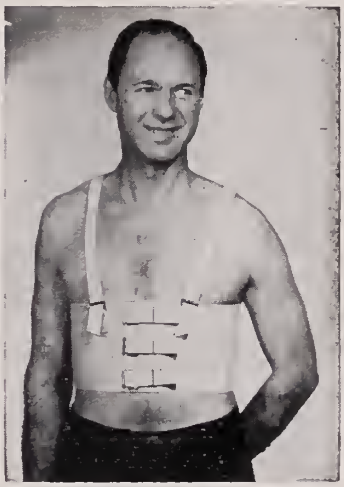
CATARACT, MYO-THIN and other difficult and complicated lenses are ground to extreme thinness and accuracy by our expert workmen.

ARTHUR F. WILLIAMS
SAINT PAUL
MINNESOTA

a new trend in rib binding . . .

P&H ELASTIC RIB BELTS

P&H



This new P&H Elastic Rib Belt provides firm, yet gentle, uniform support with needed compression. The belt is made of a strong elastic band with attached webbing straps and has adjustable buckles that do not touch the skin. Far more comfortable and effective than adhesive strapping.

A complete stock of all sizes for both male and female is available at all times.

For expert fitting and prompt, courteous service, call FEderal 2-2494.

MM-756

Physicians & Hospitals Supply Co.
1400 Harmon Place Minneapolis 3, Minn.

Brown & Day, Inc.

when a

SURGICAL SUPPORT

is indicated . . .

We invite you
to call upon the services
of our

SURGICAL APPLIANCE
DEPARTMENT

- in our fitting rooms
- in the hospitals
- in the home

"Everything for the Physician"

for fast service call CA 2-1845

SERVICE BROWN & DAY INC. SAINT PAUL U.S.A. QUALITY

62-64 EAST 5TH ST
St. Paul 1, Minn

"...in patients
with moderately
severe and severe
cardiac failure,
neohydrin
is the oral diuretic
of choice."*

*Moyer, J. H., and others:
J. Chronic Dis. 2:670, 1955.

NEW!
Patented HANSEN
Split Frame Truss

Positive Hernia Control

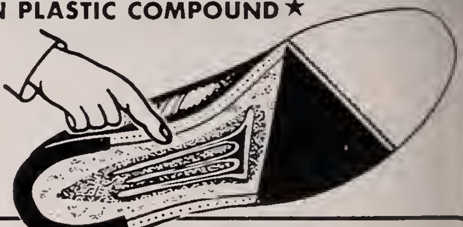
Contoured Spring Design Gives
Custom Made Comfort
Unlimited Body Activity

Single with Dummy Illustrated
Double not illustrated

C. F. ANDERSON CO., INC.

901 Marquette
Minneapolis, Minnesota

PATENTED ARCH SUPPORT CONSTRUCTION — WIDE STEEL SHANK IMBEDDED IN PLASTIC COMPOUND ★



- Insole extension and wedge at inner corner of heel where support is most needed.

★ The patented arch support construction is guaranteed not to break down.

- Innersoles guaranteed not to crack or collapse.
- Foot-so-Port lasts designed and the shoe construction engineered with orthopedic advice.
- Conductive Shoes for surgical and operating room personnel. N.B.F.U. specifications.
- We are also the manufacturer of the Geor-Action Shoe designed by noted orthopedic surgeon.
- We make more shoes for polio, club feet and disabled feet than any other shoe manufacturer.

Send for free booklet, "The Preservation of the Function of the Foot Balancing and Synchronizing the Shoe with the Foot."

Write for details or contact your local **FOOT-SO-PORT** *Shoe Agency. Refer to your Classified Directory*

Foot-so-Port Shoe Company, Oconomowoc, Wis
A Division of Musebeck Shoe Company

brand new

arlidin

vasorelaxation
more tissue oxygen
improved muscle metabolism
pain relief
well tolerated • rapid • sustained

helps your peripheral vascular patients walk longer, further, in more comfort

"strong muscle vasodilator activity and an adequate increase in cardiac output"[1]

effective "vasodilative agent of minimal toxicity and optimal tolerance"[2]

in intermittent claudication
diabetic vascular disease
Raynaud's disease
thromboangiitis obliterans
ischemic ulcers
night leg cramps

ARLIDIN dilates peripheral blood vessels in distressed muscles, relaxes spasm, increases both cardiac and peripheral blood flow . . . to send more blood where more blood is needed.

dose: 1 tablet t. i. d. or q. i. d.
bottles of 50, 100 and 1000.

arlidin* HCl
brand of nylidrin hydrochloride
tablets **6 mg.**

1. Pomeranze, J. et al.: Angiology, June, 1955.
2. Freedman, L.: Angiology 6:52, Feb. 1955.

Write for samples and literature
arlington-funk laboratories
division of U. S. Vitamin Corporation
250 East 43rd Street, New York 17, N.Y.

*Trade Mark

Classified Advertising

Replies to advertisements with key numbers should be mailed in care of MINNESOTA MEDICINE *2642 University Avenue, Saint Paul 14, Minnesota.*

AVAILABLE FOR LOCUM TENENS, two weeks, during July, August or September. Physician with general medical experience, now in pediatric training, wishes either general or pediatrics practice. Address E-537, care MINNESOTA MEDICINE.

WANTED—Board-certified or board-eligible ophthalmologist. Group of thirteen doctors in small midwest community. Liberal starting salary and partnership after one year. Address E-525, care MINNESOTA MEDICINE.

WANTED—Associate in general practice. Excellent office, housing, schools, and hospital facilities. Early partnership. Twenty-five miles northwest of Minneapolis. R. D. Thielen, M.D., St. Michael, Minnesota.

WANTED—Young general practitioner, desirably with some training in internal medicine or gynecology, to join general surgeon. Excellent working conditions. Town 5000, one hour's drive to Twin Cities. New hospital, industry, golf, fishing, resort, etc. Partnership available. Address E-532, care MINNESOTA MEDICINE.

WANTED—Physician interested in Internal Medicine. New ultra-modern 100-bed GM&S hospital. Modern 2-bedroom apartment available at nominal rent. Salary range from $8,990 to $14,000 depending upon qualifications. Our Chiefs of Medicine and Surgery are both Board men. Apply M. J. Robertson, M.D., Manager, Veterans Administration Hospital, Miles City, Montana

WANTED—Obstetrician and pediatrician want physician to do general medicine in suburban Minneapolis area. Individual practice at minimum expense. Write Box E-540, care MINNESOTA MEDICINE.

APARTMENT WANTED, furnished, by single physician to start practice in Hopkins September 1. Consider sharing suitable quarters. Write E-539, care of MINNESOTA MEDICINE.

PHYSICIAN NEEDED—In county seat town of 18
located in excellent farming community. Cent
Minnesota. No other physician within 35-mile radi
New 25-bed hospital planned. Good schools a
housing. Office available. Address Kenneth Matts
Mahnomen, Minnesota.

FOR SALE—Used General Electric, 100 milliamp
x-ray machine, good as new. Model R-2-39, Se
Number 288395. Completely dismantled. Ready
shipment anywhere. Interested buyer can be assu
of good deal. Write or call Grand Rapids Clinic, 5
First Avenue N.W., Grand Rapids, Minnesota. T
phone FAirview 6-3436.

FOR SALE—General practice, established 30 ye
Gross over $45,000. Easy terms. New building a
equipment. Prosperous community, central Minneso
Excellent hospital facilities. Will introduce. Addr
E-533, care MINNESOTA MEDICINE.

DOCTOR OR DENTIST—Beautiful suite in So
Minneapolis. Very modern. Six months free rent. T
option of lease at very reasonable rent. Wm.
Cochrane, 4101 - 42nd Avenue South, Minneapo
Minnesota. Telephone Ro 9-8758.

FOR RENT—Highland Shopping Area, equipped of
available, full or part time. Share with surgeon
dentist. Excellent for general practice, obstetr
pediatrics. No equipment necessary; no rent u
established. H. Schwyzer, M.D., 2069 Ford Parkw
Saint Paul. Telephone: MI 8-4832 or CA 4-74

ATTENTION DENTISTS AND DOCTORS—Mod
space available for dentists' and doctors' offices.
location where several sets of doctors and dent
have been long established and then built their o
clinics. A money maker. Above Kisch's Food Marl
Plenty of auto parking space. Apply 637 Stry
Avenue, Saint Paul, Minnesota.

FOR RENT OR SALE—Eight-room, first-floor ph
cian's office. Well equipped. Near Twin Cities. Gr
over $30,000. New hospital—unlimited privile
Good opportunity. Write E-511, care MINNESO
MEDICINE.

SKILL AND CARE!

Combine with quality materials in all Buchstein-Medcalf orthopedic appliances. Our workmanship and scientific design conform to the most exacting professional specifications. Accepted and appreciated by physicians and their patients for more than 45 years.

ARTIFICIAL LIMBS, TRUSSES,
ORTHOPEDIC APPLIANCES,
SUPPORTERS, ELASTIC HOSIERY

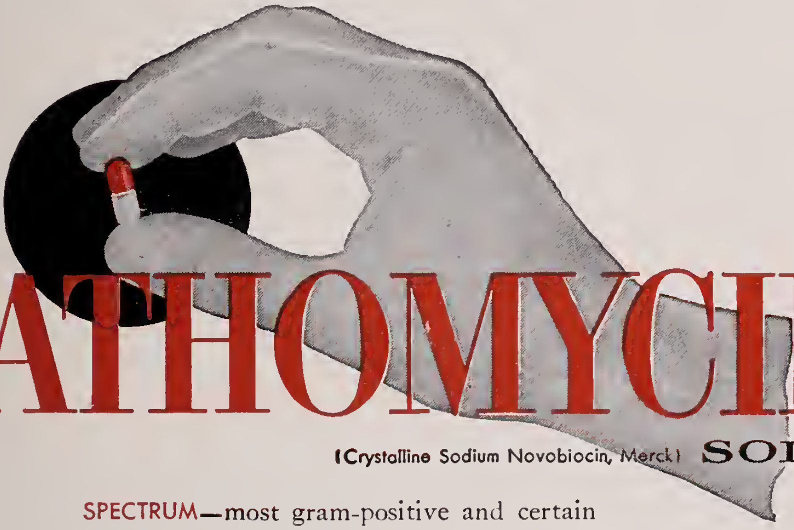
Prompt, painstaking service

Buchstein-Medcalf Co.

223 So. 6th St. Minneapolis 2, Minn.

THE BANK
WHERE YOU
FEEL AT
HOME

the AMERICAN
NATIONAL BANK OF SAINT PAUL
MEMBER FEDERAL DEPOSIT INSURANCE CORPORATION



NOW AVAILABLE...

a unique new antibiotic of major importance

PROVED EFFECTIVE AGAINST SPECIFIC ORGANISMS
(staphylococci and proteus)
RESISTANT TO ALL OTHER ANTIMICROBIAL AGENTS

'CATHOMYCIN'

(Crystalline Sodium Novobiocin, Merck) **SODIUM**

SPECTRUM—most gram-positive and certain gram-negative pathogens.

ACTION—bactericidal in optimum concentration even to resistant strains.

TOXICITY—generally well tolerated. This is more fully discussed in the package insert.

ABSORPTION—oral administration produces high and easily-maintained blood levels.

INDICATIONS—cellulitis, pyogenic dermatoses, septicemia, bacteremia, pneumonia and enteritis due to *Staphylococcus* and infections involving certain strains of *Proteus vulgaris;* including strains resistant to all other antibiotics.

DOSAGE—four capsules (one gram) initially and then two capsules (500 mg.) twice daily.

SUPPLIED—250 mg. capsules of 'CATHOMYCIN', bottles of 16.

'CATHOMYCIN' *is a trademark of Merck & Co., Inc.*

SHARP DOHME
Philadelphia 1, Pa.
DIVISION OF MERCK & CO., INC.

A more complete gall bladder regimen in a single tablet...

Colicell

Each Tite-Coat Red Tablet Contains:

Extracts of Whole Bile (Equal parts Ox and Hog) .... 210.0 mg.
Ketocholanic Acids (Oxidized or keto form of normally occurring bile acids containing approximately 93% dehydrocholic acid) ...... 90.0 mg.
Methyl Cellulose .... 130.0 mg.
Homatropine Methylbromide .... 2.5 mg.
(in bottles of 100 and 1000 tablets.)

- *more effective . . . for a longer period of time*
- *specially coated to prevent gastric disturbance*
- *lower cost than most bile acid preparations that have only a single purpose*

SINCE 1883

SAMPLES AND LITERATURE ON REQUEST
SUTLIFF & CASE CO., INC.
Pharmaceutical Specialties
PEORIA, ILLINOIS

Index to Advertisers

Aloe, A. S., Co. A-24
American Meat Institute 460-D
American National Bank of Saint Paul A-36
Anderson, C. F., Co., Inc. A-34
Arlington-Funk Laboratories A-35
Ayerst Laboratories A-39

Bayer Co. A-14
Benson, N. P., Optical Co. A-22
Birches Sanitarium, Inc. A-22
Breon, George A., & Co. A-5
Brown & Day, Inc. A-34
Buchstein-Medcalf Co. A-36
Burroughs Wellcome & Co. A-16

Caswell-Ross Agency 460-A
Ciba A-24
Classified Advertising A-36
Cook County Graduate School of Medicine A-28

Dalco Pharmacal Co. A-33
Danielson Medical Arts Pharmacy, Inc. A-38
Druggists Mutual Insurance Co. A-38

Foot-so-Port Shoe Co. A-34

Geigy Pharmaceuticals A-20
Gyne-Cytology Laboratory A-32

Hoffmann-La Roche, Inc. .... Facing A-20

Juran & Moody, Inc. A-8

Lakeside Laboratories (Neohydrin) A-15, A-28, A-3
Lederle Laboratories 460-B, 460-C, A-3
Lilly, Eli, & Co. .... Cover I, A-3

Medical Protective Co. A-3

Parke, Davis & Co. .... Cover II, A-
Pfizer Laboratories, Div. Chas. Pfizer & Co., Inc. A-13, A-2
Physicians Casualty & Health Associations A-2
Physicians & Hospitals Supply Co. A-32, A-3
Professional Credit Protective Bureau A-1

Radium Rental Service A-3

St. Croixdale Sanitarium A-2
St. Paul Fire & Marine Insurance Co. A-2
Schering Corporation .... Insert facing page A-4, A-6, A-
A-17, A-
Searle, G. D., & Co. A-3
Sharp & Dohme A-9, A-10, A-11, A-2
A-27, A-37, A-
Smith, Kline & French Laboratories .... Cover I
Squibb .... Cover I
Sutliff & Case Co., Inc. .... A-

U. S. Vitamin Corporation A-3

Viceroy Cigarettes A-1

Wallace Laboratories .... A-
Williams, Arthur F. .... A-
Winthrop Laboratories .... A
Wyeth, Inc. A-1

DANIELSON MEDICAL ARTS PHARMACY, INC.

PHONES:
FEderal 3-3317
FEderal 3-3318

10-14 Arcade, Medical Arts Building
825 Nicollet Avenue—Two Entrances—78 South Ninth Street
MINNEAPOLIS

HOURS:
WEEK DAYS—8 to 7
SUN. & HOL.—10 to 1

Insurance at a Saving

Druggists' Mutual Insurance Company
OF IOWA, ALGONA, IOWA

Fire - Tornado - Automobile Insurance

Prompt Loss Service

MINNESOTA REPRESENTATIVE—S. E. STRUBLE, WYOMING, MINN.

specify

Lederle

POLIOMYELITIS IMMUNE GLOBULIN

(human)

For the modification of measles and the prevention or attenuation of infectious hepatitis and poliomyelitis.

LEDERLE LABORATORIES DIVISION
AMERICAN Cyanamid COMPANY
PEARL RIVER, NEW YORK

Malpractice Prophylaxis

With us
policyholders are in less jeopardy from malpractice claims and suits today
than they have been
for the past thirty years

Specialized Service makes our doctor safer

THE
MEDICAL PROTECTIVE COMPANY
FORT WAYNE, INDIANA

Professional Protection Exclusively
since 1899

MINNEAPOLIS Office:
Robert L. McFerran and
John Hansel, Representatives
311 East 24th St., Apt. A-1
Telephone Federal 9-1292

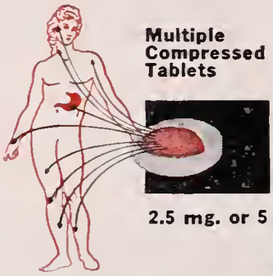
EVERY WOMAN WHO SUFFERS IN THE MENOPAUSE DESERVES "PREMARIN."

widely used natural, oral estrogen

AYERST LABORATORIES
New York, N. Y. • Montreal, Canada
5645

in respiratory allergies
ROUTINE
CO-ADMINISTRATION
MEANS
'Co-Deltra'
(Buffered Prednisone)

'Co-Hydeltra'
(Buffered Prednisolone)


Multiple
Compressed
Tablets

Clinical evidence[1, 2, 3] indicates that to augment the therapeutic advantages of prednisone and prednisolone, antacids should be *routinely* co-administered to minimize gastric distress.

2.5 mg. or 5 mg. prednisone or prednisolone with 50 mg. magnesium trisilicate and 300 mg. aluminum hydroxide gel.

SHARP & DOHME
Philadelphia 1, Pa.
DIVISION OF MERCK & CO., INC.

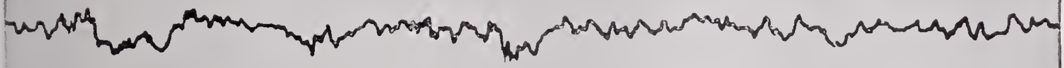
References: 1. Boland, E. W., *J.A.M.A.* 160:613, February 25, 1956. 2. Margolis, H. M., *et al.* *J.A.M.A.* 158:454, June 11, 1955. 3. Bollet, A. J., *et al.* *J.A.M.A.* 158:459, June 11, 1955.

'CO-DELTRA' *and* 'CO-HYDELTRA' *are the trademarks of* MERCK & CO., INC.

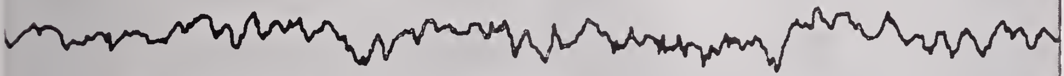
ALL THE BENEFITS OF THE "PREDNI-STEROIDS" PLUS POSITIVE ANTACID ACTION TO MINIMIZE GASTRIC DISTRESS

WHAT IS THE DIFFERENCE BETWEEN A TRANQUILIZER AND A SEDATIVE?

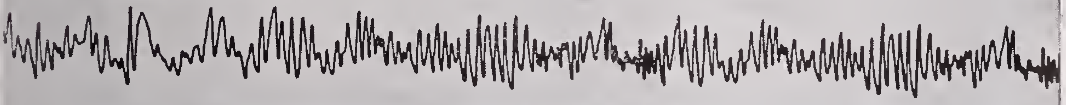
Comparison of the effect of Raudixin (tranquilizer) and a barbiturate (sedative) on the cortical electroencephalogram



No drug.



After Raudixin. E. E. G. not altered.



After barbiturate. Typical "spindling" effect.

Because barbiturates and other sedatives depress the cerebral cortex, the sedation achieved is accompanied by a reduction in mental alertness.

Raudixin acts in the area of the midbrain and diencephalon, and does not depress the cerebral cortex. Consequently, the tranquilizing (ataractic) effect achieved is generally free of loss of alertness.

RAUDIXIN

Squibb Whole Root Rauwolfia Serpentina

DOSAGE: 100 mg. b.i.d. initially; may be adjusted within a range of 50 mg. to 500 mg. daily. Most patients can be adequately maintained on 100 mg. to 200 mg. per day.

SUPPLY: 50 mg. and 100 mg. tablets; bottles of 100, 1000 and 5000.

SQUIBB *Squibb Quality—the Priceless Ingredient*

'RAUDIXIN'® IS A SQUIBB TRADEMARK

announcing . . .

Cytomel*

a new agent for treatment of

metabolic insufficiency

Because it exerts its metabolic effect directly at the cellular level, 'Cytomel' offers the first positive treatment for the many clinical problems caused by metabolic insufficiency—such as physical sluggishness, slowed-down mental capacity and decreased emotional control, and decreased function in various organs and organ systems.

'Cytomel' works swiftly—a positive effect will often be seen within several days in patients suffering from metabolic insufficiency.

'Cytomel' Tablets are available in two strengths:
5 mcg. and 25 mcg. of L-triiodothyronine, S.K.F., as the sodium salt. In bottles of 100.

LT3

*Trademark for

L-triiodothyronine, S.K.F.

Smith, Kline & French Laboratories, Philadelphia

STACKS

NMMA Annual Meeting—Alexandria—Sept. 7-8, 1956

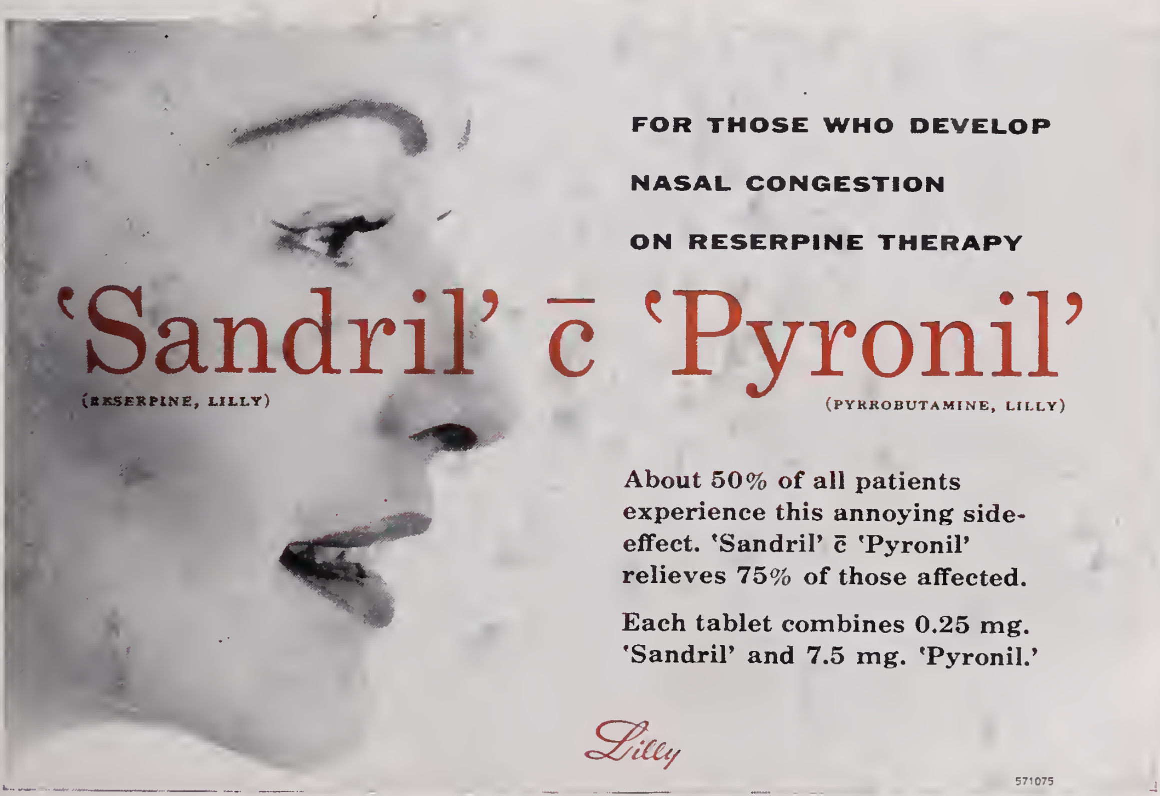
SMMA Annual Meeting—New Ulm—Sept. 10, 1956

Minnesota MEDICINE

PUBLISHED MONTHLY BY THE MINNESOTA STATE MEDICAL ASSOCIATION

Volume 39 AUGUST, 1956 Number 8

Printed in U.S.A. (Table of Contents—Pages A-2 and A-3) 40c a copy—$3.00 a year



FOR THOSE WHO DEVELOP
NASAL CONGESTION
ON RESERPINE THERAPY

'Sandril' c̄ 'Pyronil'

(RESERPINE, LILLY) (PYRROBUTAMINE, LILLY)

About 50% of all patients experience this annoying side-effect. 'Sandril' c̄ 'Pyronil' relieves 75% of those affected.

Each tablet combines 0.25 mg. 'Sandril' and 7.5 mg. 'Pyronil.'

Lilly

571075

that the epileptic patient

may enjoy fuller life

DILANTIN® SODIUM

(diphenylhydantoin sodium, Parke-Davis)

For patients with grand mal and psychomotor seizures,

DILANTIN — alone or in combination — continues as an anticonvulsant of choice. Effective control of seizures, with resulting greater social acceptance and increased vocational opportunities, forecasts a fuller life for such patients. DILANTIN has little or no hypnotic effect.

DILANTIN Sodium is supplied in a variety of forms — including Kapseals® of 0.03 Gm. (½ gr.) and 0.1 Gm. (1½ gr.) in bottles of 100 and 1,000.

DILANTIN SODIUM
KAPSEALS DILANTIN SODIUM
PARKE DAVIS & CO

MILONTIN® Kapseals and Suspension

(phensuximide, Parke-Davis)

For patients with petit mal epilepsy, a drug of choice in initiating treatment — with very few and mild side effects.

MILONTIN Kapseals, 0.5 Gm., bottles of 100 and 1,000; also available as MILONTIN Suspension (250 mg. per 4 cc.) in 16-ounce bottles.

For patients with mixed grand mal—petit mal epilepsy, compatibility permits use of DILANTIN with MILONTIN.

MILONTIN SUSPENSION
MILONTIN

MEDICAMENTA VERA
PD & CO.

PARKE, DAVIS & COMPANY DETROIT, MICHIGAN

50060

Volume 39
Number 8

Minnesot

Contents fr

SCIENTIFIC ARTICLES

ORIGINAL CONTRIBUTIONS

The Physician and the Mentally Retarded Child
Jack V. Wallinga, M.D., Oakland, California.......... 509

Sigmoido-perineal Fistula from Diverticulitis of the Sigmoid Colon
Howard M. Frykman, M.D., Minneapolis, Minnesota 513

Nervous System Findings Associated with Systemic Lupus Erythematosus
Edward C. Clark, M.D., and *Robert E. Yoss, M.D.,* Rochester, Minnesota 517

Therapy of Serous Cavity Effusion with Colloidal Radioactive Gold 198
Edward P. Engels, M.D., E. C. Paulson, M.D., and *Donn G. Mosser, M.D.,* Minneapolis, Minnesota.... 521

Treatment of Cutaneous Scars by Dermabrasion
Carl W. Laymon, M.D., and *Charles J. Balogh, M.D.,* Minneapolis, Minnesota 524

Chronic Lower Lip Lesions—Treatment by the "Lip-shave" Operation
John K. Grotting, M.D., Minneapolis, Minnesota.... 527

Children and Farm Accidents
George B. Logan, M.D., and *Arthur C. Smid, M.D* Rochester, Minnesota ....

Activities of the Sears, Roebuck Foundation
J. Arnold Bargen, M.D., Rochester, Minnesota.. .

CASE PRESENTATIONS

Primary Adenocarcinoma of the Appendix Associat with a "Krukenberg Tumor"
S. T. Nerenberg, M.D., H. Hoffert, M.D., and *Potente, M.D.,* Minneapolis, Minnesota...........

Hypernephroma in Infancy and Childhood
M. P. Reiser, M.D., and *C. D. Creevy, M.D.,* Minn apolis, Minnesota 5

CONTINUATION STUDIES

Psychiatric Aspects of the Handicapped Child
Reynold A. Jensen, M.D., Minneapolis, Minnesota. 5

CURRENT CARDIAC CONCEPTS

Functional Heart Disease
Geoffrey Bourne, M.D., London, England.... ... 5

TUMOR CONFERENCE

Case Studies
C. R. Hitchcock, M.D., Editor........................... ...5

Official Journal of

Duluth Surgical Society
Minneapolis Academy of Medicine
Minneapolis Obstetrical and Gynecological Society
Minneapolis Surgical Society
Minnesota Academy of Medicine
Minnesota Obstetric and Gynecologic Society

Owner and Publisher

Published by MINNESOTA STATE MEDICAL ASSOCIATION
496 Lowry Medical Arts Building
St. Paul 2, Minnesota

Editing and Publishing Committee

E. M. Hammes, M.D.
Chairman, Saint Paul
F. M. Owens, Jr., M.D.
Saint Paul
T. A. Peppard, M.D.
Minneapolis
Henry Ulrich, M.D.
Minneapolis

Business Manager

R. R. Rosell
496 Lowry Medical Arts Building
St. Paul 2, Minnesota

GENE

Authors

Manuscripts should be addressed to Arthur H. Wells, M.D., Editor, 915 East Street. Duluth 5, Minnesota. Telephone RA 7-6636 or JA 5-2319. Original papers pr for publication solely in Minnesota Medicine will be considered by the Board of providing they fulfill the following editorial standards. Manuscripts should be double spaced on white paper with at least 1-inch margins. The original (not a copy) is requested. The title on the first page should be under six words if p or divided into two parts. The author should give his highest degree, his instit position or his relationship to a hospital or medical organization which he m addressing. Pages should be numbered consecutively and the author's last name appear at the top of each page after the first page.

Biographical references should appear on a separate sheet entitled "Bibliography." should appear and be numbered consecutively in the order in which they first oc the text (not alphabetically). Citations in the text require reference numbers author's or authors' names are not used or if there is more than one reference same author or group of authors. All references to author should appear Bibliography and no references should be included which are not in the text. Th and exact punctuation used in the J.A.M.A. references is requested. For a journal *Author's last name, initial, initial.: title of paper. Abbreviated name of journal, number: page, year.* Book references should give author, title. edition number publisher and year.

Illustrations (photographs, tables and graphs) should be submitted separately ar combined in the text. There should be a separate sheet entitled "Illustrations" contains the various types of illustrations listed separately and numbered in the

Medicine

ugust, 1956

Volume 39
Number 8

MISCELLANEOUS ARTICLES

ORIALS

cardiac Pressure Tracings 548
r Conservation 548
Coupon and Collection Services 549
duction to Photoengraving 549
New Frontier 550
bilitation in Pulmonary Tuberculosis 551
History of Glass Containers 551
Television? 552
enience Foods 553

IDENT'S LETTER

er Detection in the Physician's Office 554

CAL ECONOMICS

dent Signs Military Dependents' Medical Care ll 556
te and House Actions on Matters of Medical terest 556
erence on Aging 557
batting Malpractice Actions 557
ical Students' Income Sources Listed 557
ical Costs Not Highly Criticized 558
Medical Surveys of Interest 558
New Grants for Vitamin, Nutrition Research 558

AMERICAN MEDICAL ASSOCIATION

Proceedings of the House of Delegates, June 11-15, 1956 559

IN MEMORIAM

Arthur V. Garlock 561

MEETINGS AND ANNOUNCEMENTS 562

WOMAN'S AUXILIARY 565

GENERAL INTEREST 566

BOOK REVIEWS A-38

CLASSIFIED ADVERTISING A-40

INDEX TO ADVERTISERS A-41

* * *

nnesota Society of Clinical Pathologists
nnesota Society of Internal Medicine
nnesota Society of Neurology and Psychiatry
Minnesota State Medical Association
Minnesota Surgical Society
Northern Minnesota Medical Association
Southern Minnesota Medical Association

RMATION

ch they appear in the text. All photographs must be in black and white, clear ntrasting, and on glossy prints. Instructions for combining photographs are ble. Any number of illustrations over 4 are charged to the author. Combinations tographs up to one-half page (6 x 4⅜ inches) count as 1 illustration.

rs and Reviewers

right is reserved to reject material submitted for reading or advertising columns. ews expressed in this journal do not necessarily represent those of the Minnesota Medical Association or any of its constituents.

tisers and Subscribers

sified advertising—10 cents a word; minimum charge $2.00; key number, 25c nal. Remittance should accompany order. Display advertising rates on request.

ual Subscription—$3.00. Single Copies—$0.40. Foreign and Canadian—$3.50.

munications concerning advertising and subscriptions should be addressed to SOTA MEDICINE, 2642 University Avenue, Saint Paul 14, Minnesota. Telephone Mid- 2641.

ight and Post Office Entry

tents of MINNESOTA MEDICINE ©1956 by Minnesota State Medical Association.

red at the Post Office in Saint Paul as second class matter. Accepted for mailing at ecial rate of postage provided for in Section 1103, Act of October 3, 1917, ized July 13, 1918.

Board of Editors

ARTHUR H. WELLS, M.D.
Editor-in-Chief, Duluth

STUART W. ARHELGER, M.D.
Minneapolis

JOHN F. BRIGGS, M.D.
Saint Paul

S. FRANCIS CEPLECHA, M.D.
Redwood Falls

TAGUE C. CHISHOLM, M.D.
Minneapolis

ROBERT B. HOWARD, M.D.
Minneapolis

R. DREW MILLER, M.D.
Rochester

HENRY G. MOEHRING, M.D.
Duluth

GLENN J. MOURITSEN, M.D.
Fergus Falls

OLIVE V. SEIBERT, B.A.
Saint Paul

GEORGE STILWELL, M.D
Rochester

WHY
SENSITIZE

in topical and ophthalmic infections

USE
'POLYSPORIN'®
brand

POLYMYXIN B—BACITRACIN OINTMENT

*to insure broad-spectrum therapy
with minimum allergenicity*

For topical use: in ½ oz. and 1 oz. tubes.
For ophthalmic use: in ⅛ oz. tubes.

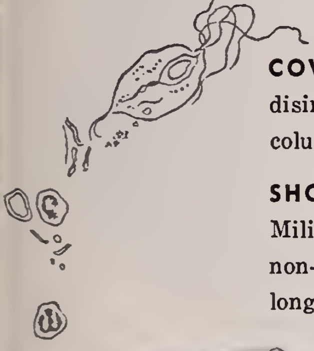
BURROUGHS WELLCOME & CO. (U.S.A.) INC., Tuckahoe, N.Y.

Against the "Vaginitis Spectrum"

TRICHOMONAS
MONILIA
BACTERIA

A welcome clinical advance...
effective medication
in an appealing form

Soft and pliant as a tampon, the Milibis vaginal suppository offers proved therapeutic action* in a vehicle giving unusual clinical advantages to both patients and physician.



COVERS CERVIX AND VAGINAL WALL—The pliant Milibis suppository disintegrates readily and molds itself to the cervix as well as the columns and rugae of the vaginal vault.

SHORT DOSAGE SCHEDULE—The short course of treatment with Milibis—only 10 suppositories in most cases—together with the clean, odorless, non-staining qualities eliminates psychic barriers which often interrupt longer treatments before complete cure.

MILIBIS® Vaginal Suppositories

Supplied: boxes of 10

Winthrop LABORATORIES
New York 18, N.Y.

*97 per cent effective in a study of 564 cases; 94 per cent effective in a series of 510 cases.

Milibis (brand of glycobiarsol), trademark reg. U.S. Pat. Off.

NOW AVAILABLE....

to overcome specific infections that do not respond to any other antibiotic....[1,2,3]

New...

Today's resistant pathogens are the tough survivors of a dozen widely-used antibiotics. Certain organisms, notably *Staphylococcus aureus*[4] and susceptible strains of *Proteus vulgaris*, produce infections which have been resistant to *all* clinically useful antibiotics.

To augment your armamentarium against these resistant infections, 'Cathomycin' (Novobiocin, Merck), derived from an organism recently discovered and isolated in the Merck Sharp & Dohme Research Laboratories,[1] is now available.

SPECTRUM—'Cathomycin' [1,2,3,5,6] has also been shown to be active against other organisms including—*D. pneumoniae*, *N. intracellularis*, *S. pyogenes*, *S. viridans* and *H. pertussis*, but clinical evidence must be further evaluated before 'Cathomycin' can be recommended for these pathogens.

ACTION—'Cathomycin' in optimum concentration is bactericidal. Cross-resistance with other antibiotics has not been observed.[7]

TOLERANCE—'Cathomycin' is generally well tolerated by most patients. [5,6,8,9,10,11]

'CATHOMYCIN'

(Crystalline Sodium Novobiocin, Merck)

SODIUM

ABSORPTION—'Cathomycin' is readily absorbed, [5,6,9] and oral dosage produces significant blood and tissue levels which persist for at least 12 hours.[7]

INDICATIONS: Clinically 'Cathomycin' has proved effective for cellulitis, carbuncles, skin abscesses, wounds, felons, paronychiae, varicose ulcer, pyogenic dermatoses, septicemia, bacteremia, pneumonia and enteritis due to *Staphylococcus* and infections caused by susceptible strains of *Proteus vulgaris*.[6,7,8,9,10,11,12,13,14] Also, it is of particular value as an adjunct in surgery since staphylococcic infections seem prone to complicate postoperative courses.

DOSAGE: Four capsules (one gram) initially and then two capsules (500 mg.) twice daily.

SUPPLIED: 'Cathomycin' Sodium (Crystalline Sodium Novobiocin, Merck) in capsules of 250 mg., bottles of 16.

'CATHOMYCIN' *is a trademark of Merck & Co., Inc.*

REFERENCES:

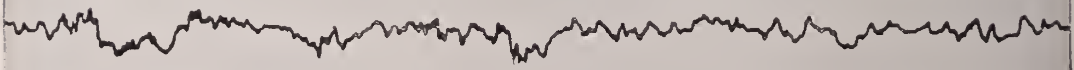
1. Wallick, H., Harris, D.A., Reagan, M.A., Ruger, M., and Woodruff, H.B., *Antibiotics Annual*, 1955-1956, New York, Medical Encyclopedia, Inc., 1956, pg. 909.
2. Frost, B.M., Valiant, M.E., McClelland, L., Solotorovsky, M., and Cuckler, A.C., *Antibiotics Annual*, 1955-1956, pg. 918.
3. Verwey, W.F., Miller, A.K., and West, M.K., *Antibiotics Annual*, 1955-1956, pg. 924.
4. Kempe, C.H., *Calif. Med.*, **84**:242, (April) 1956.
5. Simon, H.J., McCune, R.M., Dineen, P.A.P., Rogers, D.E., *Antib. Med.*, 2:205, (April) 1956.
6. Lubash, G., Van Der Meulen, J., Berntsen, C., Jr., Tompsett, R., *Antib. Med.*, 2:233, (April) 1956.
7. Lin, F.-K., Coriell, L.L., *Antib. Med.*, 2:268, (April) 1956.
8. Limson, B.M., Romansky, N.J., *Antib. Med.*, 2:277, (April) 1956.
9. Morton, R.F., Prigot, A., Maynard, A. de L., *Antib. Med.*, 2:282, (April) 1956.
10. Nichols, R.L., Finland, M., *Antib. Med.*, 2:241, (April) 1956.
11. Mullins, J.F., Wilson, C.J., *Antib. Med.*, 2:201, (April) 1956.
12. David, N.A., Burgner, P.R., *Antib. Med.*, 2:219, (April) 1956.
13. Martin, W.J., Heilman, F.R., Nichols, D.R., Wellman, W.E., and Geraci, J.E., *Antib. Med.*, 2:258, (April) 1956.
14. Milberg, M.B., Schwartz, R.D., Silverstein, J.N., *Antib. Med.*, 2:286, (April) 1956.

MSD

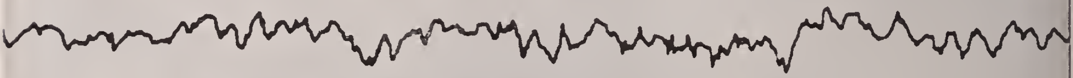
MERCK SHARP & DOHME
DIVISION OF MERCK & CO., INC.
PHILADELPHIA 1, PA.

WHAT IS THE DIFFERENCE BETWEEN A TRANQUILIZER AND A SEDATIVE?

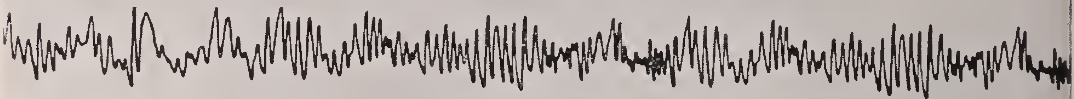
Comparison of the effect of Raudixin (tranquilizer) and a barbiturate (sedative) on the cortical electroencephalogram



No drug.



After Raudixin. E. E. G. not altered.



After barbiturate. Typical "spindling" effect.

Because barbiturates and other sedatives depress the cerebral cortex, the sedation achieved is accompanied by a reduction in mental alertness.

Raudixin acts in the area of the midbrain and diencephalon, and does not depress the cerebral cortex. Consequently, the tranquilizing (ataractic) effect achieved is generally free of loss of alertness.

RAUDIXIN

Squibb Whole Root Rauwolfia Serpentina

DOSAGE: 100 mg. b.i.d. initially; may be adjusted within a range of 50 mg. to 500 mg. daily. Most patients can be adequately maintained on 100 mg. to 200 mg. per day.

SUPPLY: 50 mg. and 100 mg. tablets; bottles of 100, 1000 and 5000.

SQUIBB *Squibb Quality—the Priceless Ingredient*

'RAUDIXIN'® IS A SQUIBB TRADEMARK

BETTER
results are obtained with STERANE[1] — 3 to 5 times more active than hydrocortisone or cortisone.

BREATHING
capacity is greatly enhanced. "Relief of symptoms is more complete and maintained for longer periods with relatively small doses."[2]

BALANCE
of minerals and fluids usually remains undisturbed. This proves "especially advantageous in those patients with cardiac failure requiring therapy . . ."[3]

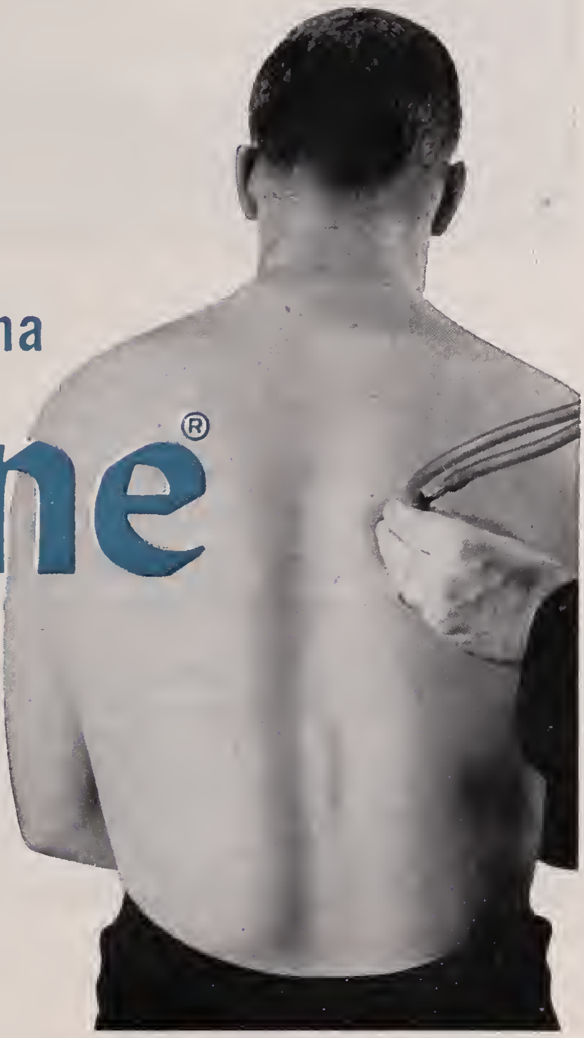
in bronchial asthma

Sterane®
brand of prednisolone

Supplied: White, 5 mg. oral tablets, bottles of 20 and 100. Pink, 1 mg. oral tablets, bottles of 100. Both deep-scored.

1. Johnston, T. G., and Cazort, A. G.: J. Allergy 27:90, 1956. 2. Schwartz, E.: New York J. Med. 56:570, 1956. 3. Schiller, I. W., et al.: J. Allergy 27:96, 1956.

PFIZER LABORATORIES
Division, Chas. Pfizer & Co., Inc.
Brooklyn 6, New York



DOCTORS EVERYWHERE NOW KNOW WHY

Viceroys Are Smoother

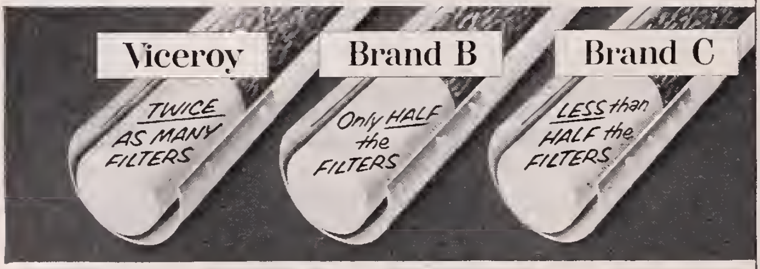
THE VICEROY TIP HAS . . .
TWICE AS MANY FILTERS

Professional men who have studied the microscopic analysis of the Viceroy filter now know why the Viceroy taste is smoother—never rough. Only Viceroy has 20,000 tiny filters in every tip—twice as many filters as the other two largest-selling filter brands. That is why Viceroys are smoother by far—never, never rough. That is why so many doctors now smoke and recommend Viceroys.

Yes, smoother taste because there are

TWICE AS MANY FILTERS IN EVERY VICEROY TIP

as the other two largest-selling filter brands!


Viceroy
TWICE AS MANY FILTERS
Brand B
Only HALF the FILTERS
Brand C
LESS than HALF the FILTERS

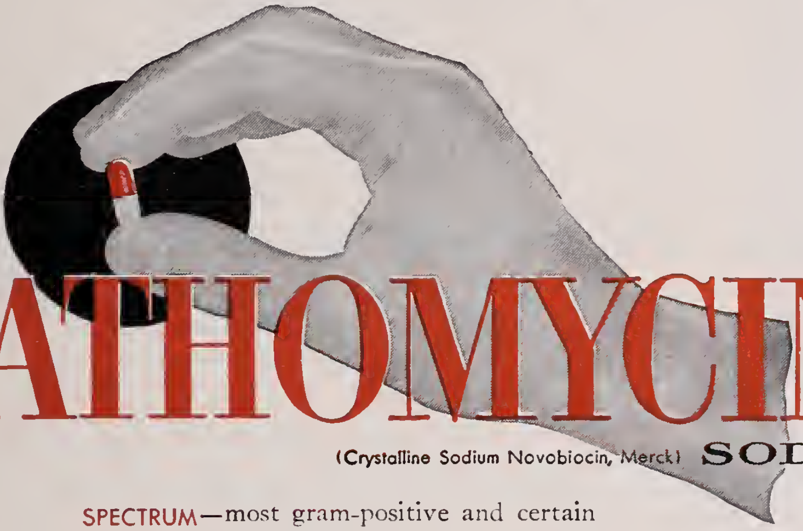
Viceroy's exclusive filter is made from pure cellulose—soft, snow-white, natural!

VICEROY
TWENTY
VICEROY
Filter Tip
CIGARETTES
KING-SIZE

NOW AVAILABLE...

a unique new antibiotic
of major importance

PROVED EFFECTIVE AGAINST
SPECIFIC ORGANISMS
(staphylococci and proteus)
RESISTANT TO ALL OTHER
ANTIMICROBIAL AGENTS



'CATHOMYCIN'

(Crystalline Sodium Novobiocin, Merck) **SODIUM**

SPECTRUM—most gram-positive and certain gram-negative pathogens.

ACTION—bactericidal in optimum concentration even to resistant strains.

TOXICITY—generally well tolerated. This is more fully discussed in the package insert.

ABSORPTION—oral administration produces high and easily-maintained blood levels.

INDICATIONS—cellulitis, pyogenic dermatoses, septicemia, bacteremia, pneumonia and enteritis due to *Staphylococcus* and infections involving certain strains of *Proteus vulgaris*, including strains resistant to all other antibiotics.

DOSAGE—four capsules (one gram) initially and then two capsules (500 mg.) twice daily.

SUPPLIED—250 mg. capsules of 'CATHOMYCIN', bottles of 16.

'CATHOMYCIN' *is a trademark of Merck & Co., Inc.*

MSD
MERCK SHARP & DOHME
DIVISION OF MERCK & CO., INC.
PHILADELPHIA 1, PA.

Combined for a

on

resistant

new

METRETON *tablets*

METICORTEN (PREDNISONE) PLUS CHLOR-TRIMETON WITH ASCORBIC ACID

For prompt and effective relief, especially in many resistant allergic disorders, Metreton affords the benefits of two established agents with unexcelled anti-inflammatory, anti-allergic and antipruritic effectiveness. *supported by essential vitamin C*—for stress support and for postulated effect on prolonging steroid action *no better corticosteroid* —original brand of prednisone...minimal electrolyte effects—Meticorten *no better antihistamine*—unexcelled in potency and freedom from side effects—Chlor-Trimeton effective against hay fever, pollen asthma, perennial rhinitis, acute and chronic urticaria, angioneurotic edema, drug reactions, inflammatory and allergic eye disorders, pruritic and contact dermatoses.

formula: Each tablet of Metreton provides 2.5 mg. of Meticorten (prednisone), 2 mg. of Chlor-Trimeton maleate (chlorprophenpyridamine maleate), and 75 mg. ascorbic acid.

supplied: Metreton Tablets, bottles of 30 and 100.

frontal attack

allergies

new

ETRETON *nasal spray*

ICORTELONE (PREDNISOLONE) PLUS CHLOR-TRIMETON

ickly clears nasal passages • avoids rebound engorgement and mpathomimetic side effects • safe even for cardiacs, hyperten- es, children, pregnant patients •

position: Contains 2 mg. (0.2%) METICORTELONE acetate (prednisolone ace- e) and 3 mg. (0.3%) of CHLOR-TRIMETON gluconate (chlorprophenpyridamine conate) in each cc.

kaging: 15 cc. plastic "squeeze" bottle, box of 1.

RETON,* brand of corticoid-antihistamine compound; METICORTEN,* brand of prednisone; ICORTELONE,® brand of prednisolone; CHLOR-TRIMETON,® brand of chlorprophenpyridamine parations. *T.M.

MT-J-576

Schering

Schering
METRETON
NASAL SPRAY
SCHERING
Schering
METRETON
TABLETS
SCHERING

KARO® SYRUP . . . meets the need for individualized infant formulas

In meeting the nutritional needs of formula-fed infants, the methods used are dependent upon the digestive capacity and tolerance of each infant.

But, whether the formula calls for sweet, acid, evaporated, dried or protein milk—Karo syrup meets the need for a well-tolerated and easily digested source of carbohydrate. This fluid mixture of dextrins, maltose and dextrose is completely utilized without inducing flatulence, colic, fermentation or allergy.

Either light or dark Karo may be used in prescribing formulas for infants because of equivalent digestive and nutritive values. Each fluid ounce (2 tablespoonfuls) yields 120 calories.

Mothers will appreciate the ease of making formulas with Karo syrup... as well as its ready availability and economy.

Karo
SYRUP
CRYSTAL WHITE

1906 • 50th ANNIVERSARY • 1956
CORN PRODUCTS REFINING COMPANY
17 Battery Place, New York 4, N. Y.

anxiety is part
of **EVERY ILLNESS**[1]

The physically sick patient faces two stresses—the sickness and the anxiety that it brings.[1] All too often, the anxiety is a threat to the patient's progress. It may intensify symptoms, give uncertainty to therapy, and impair rapport.

To combat the anxiety component of physical illness, EQUANIL promotes equanimity, relieves muscle tension, and encourages normal sleep.[2] By these specific actions, EQUANIL gives breadth to the treatment program—expands the physician's resources.

Supplied: Tablets, 400 mg., bottles of 50.
Usual Dose: 1 tablet, t.i.d.

1. Braceland, F.J.: Texas State J. Med. 51:287 (June) 1955.
2. Lemere, F.: Northwest Med. 54:1098 (Oct.) 1955.

Equanil*

Wyeth®
Philadelphia 1, Pa.

Meprobamate
(2-methyl-2-*n*-propyl-1,3-propanediol dicarbamate)

Licensed under U.S. Patent No. 2,724,720

*Trademark

anti-anxiety factor with muscle-relaxing action

A NEW

Chemical Compound

for the treatment of

PEPTIC ULCERS and HYPERACIDITY

GLYCAMINE®

TABLETS

GLYCAMINE BRAND OF HYDROXY ALUMINUM
MAGNESIUM AMINOACETATE
PAT. PEND.

PROMPT, LONG LASTING RELIEF — One tablet is sufficient to neutralize excess acidity and maintain optimum pH for 4½ hours.

A NEW CHEMICAL COMPOUND — Designed to perform a specific function . . . not a mixture of alkalis. Will not disturb acid-base balance.

RE-ESTABLISHES NORMAL DIGESTION — Does not affect enzymatic activity. Improves patient well being.

CONTROLLED ACTION — Does not stimulate acid secretion or alkalosis. No acid rebound.

NON-SYSTEMIC — Neither constipating nor laxative. Demulcent protective coating covers abraded mucosa.

COMPATIBLE — With antispasmodics and anticholinergics. Reduces gastric distress caused by many drugs.

LOW DOSAGE — Only four pleasant tasting, chew-up tablets daily. Economical to use. Assures better patient co-operation.

AVAILABLE — In bottles of 100, 500 and 1000 tablets in all drug stores.

For latest professional information and samples write

DALCO PHARMACAL CO.

Minneapolis 2, Minn.

Division of

JOSEPH E. DAHL CO., Minneapolis and St. Paul

when allergic

and inflammatory dermatoses

call for strong measures...

NEW

Meti-Derm

prednisolone, free alcohol

cream

topically—approximately twice the per milligram potency of hydrocortisone

—cosmetically acceptable, water washable

and when the prophylaxis of

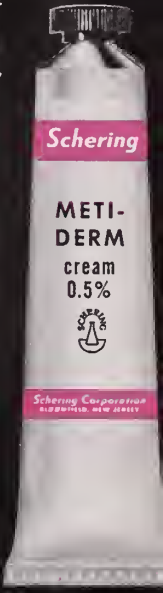
secondary infection is a factor

NEW

Meti-Derm

ointment

with neomycin


Schering
METI-
DERM
cream
0.5%
Schering Corporation

Schering

NOW, the extra assurance of

Meti-steroid strength and safety
in topical skin therapy

NEW

Meti-Derm

cream

with METICORTELONE, original brand of prednisolone

arrests itch, diminishes erythema
lessens edema, reduces scaling
speeds healing in

contact dermatitis — from plants (e.g., poison ivy, oak), drugs, soaps, cosmetics, fabrics.

atopic dermatitis — allergic eczema, food eczema, infantile eczema, disseminated neurodermatitis, pruritus with lichenification.

nonspecific pruritus of anus, vulva, scrotum.

Formula: Each gram of METI-DERM Cream contains 5 mg. (0.5%) of prednisolone, free alcohol, in a water-washable base.

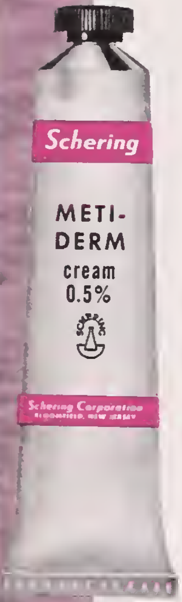
METI-DERM Ointment with Neomycin contains 5 mg. (0.5%) prednisolone, and 5 mg. (0.5%) neomycin sulfate equivalent to 3.5 mg. neomycin base.

Packaging: METI-DERM Cream, 0.5%, 10 Gm. tube.
METI-DERM Ointment with Neomycin, 10 Gm. tube.

METI-DERM,* brand of prednisolone topical.
METICORTELONE,® brand of prednisolone.
*T.M.

Schering

MD-J-5-356



For complete gall bladder regimen...

Colicell

A single COLICELL tablet is more effective for a longer period and is carefully coated to prevent gastric disturbance. In bottles of 100 and 1000 tablets.

Each Tite-Coat Red Tablet Contains:

Extracts of Whole Bile (Equal parts Ox and Hog)	210.0 mg.
Ketocholanic Acids (Oxidized or keto form of normally occurring bile acids containing approximately 93% dehydrocholic acid)	90.0 mg.
Methyl Cellulose	130.0 mg.
Homatropine Methylbromide	2.5 mg.

SAMPLES AND LITERATURE ON REQUEST

SUTLIFF & CASE COMPANY, INC.

Pharmaceutical Specialties • PEORIA, ILLINOIS

With Sunglasses
Without Sunglasses

Prescribe year-round **eye comfort** for your patients' outdoor activities

More of your patients are spending more of their time out-of-doors than ever before.

As a part of your service of providing complete eye care, we suggest you prescribe sun glasses for year-round eye comfort.

Remember, when you do, BENSON'S stands ready to give you quick, dependable service from the Upper Midwest's largest and most complete stock . . .

G15 • greens 2 and 3 • full lines of A O Calobars and B & L Ray-Bans . . . regular and large size lenses in hundreds of beautifully styled frames (plain or with precious metal trim). *Many tints available in multifocals.*

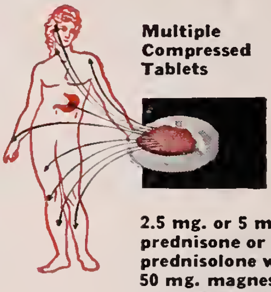
Since 1913 Benson OPTICAL COMPANY *Executive Offices* • *Minneapolis 2, Minn.*

COMPLETE LABORATORIES CONVENIENTLY LOCATED IN UPPER MIDWEST CITIES

in inflammatory skin diseases
all the benefits of the "predni-steroids"
plus positive antacid action
to minimize gastric distress

ROUTINELY ACHIEVED WITH **'Co-Deltra'**

(Buffered Prednisone)



Multiple Compressed Tablets

'Co-Hydeltra'

(Buffered Prednisolone)

Clinical evidence[1,2,3] indicates that to augment the therapeutic advantages of prednisone and prednisolone, antacids should be *routinely* co-administered to minimize gastric distress.

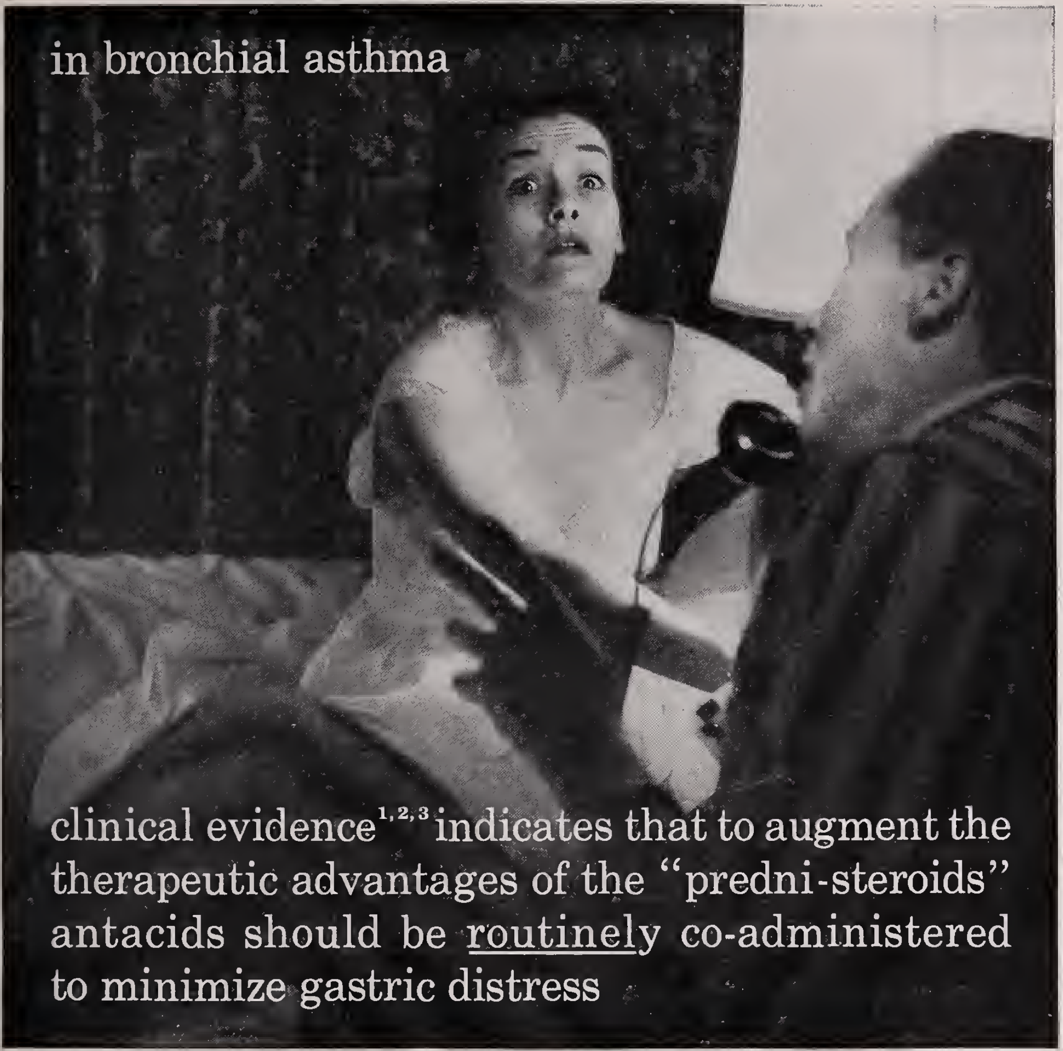
References: 1. Boland, E. W., *J.A.M.A.* 160:613, (February 25,) 1956. 2. Margolis, H. M. *et al*, *J.A.M.A.* 158:454, (June 11,) 1955. 3. Bollet, A. J. *et al*, *J.A.M.A.* 158:459, (June 11,) 1955.

2.5 mg. or 5 mg. prednisone or prednisolone with 50 mg. magnesium trisilicate and 300 mg. aluminum hydroxide gel.

MSD

MERCK SHARP & DOHME
DIVISION OF MERCK & CO., INC.
PHILADELPHIA 1, PA.

'CO-DELTRA' *and* 'CO-HYDELTRA' *are the trademarks of* MERCK & CO., INC.



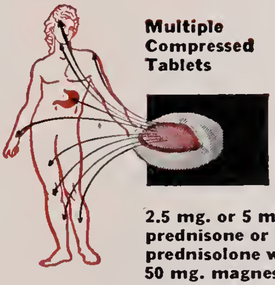
in bronchial asthma

clinical evidence[1,2,3] indicates that to augment the therapeutic advantages of the "predni-steroids" antacids should be routinely co-administered to minimize gastric distress

ROUTINE CO-ADMINISTRATION MEANS

'Co-Hydeltra'
(Buffered Prednisolone)

'Co-Deltra'
(Buffered Prednisone)



Multiple Compressed Tablets

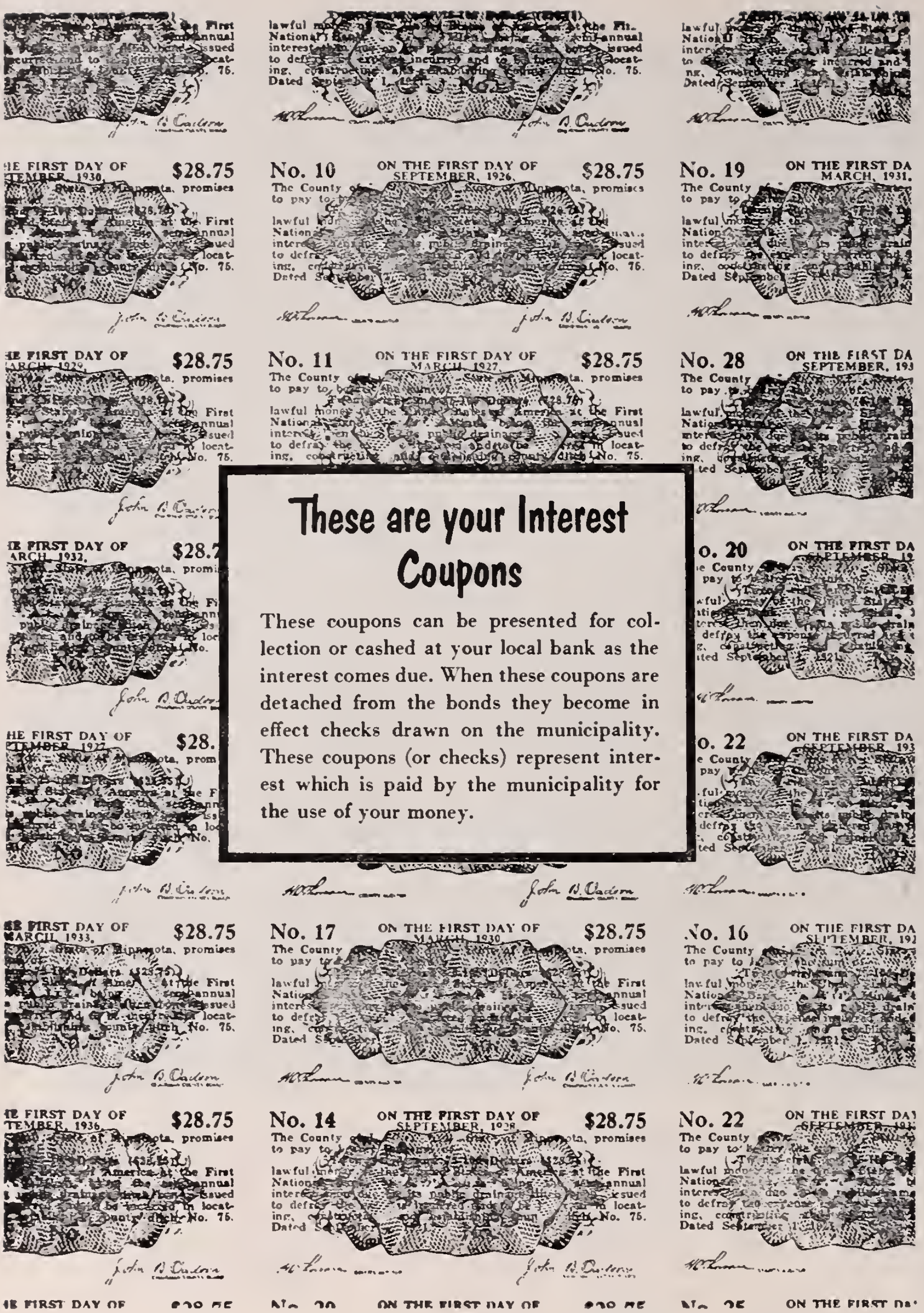
2.5 mg. or 5 mg. prednisone or prednisolone with 50 mg. magnesium trisilicate and 300 mg. aluminum hydroxide gel.

MSD
MERCK SHARP & DOHME
DIVISION OF MERCK & CO., INC.
PHILADELPHIA 1, PA.

All the benefits of the "predni-steroids" plus positive antacid action to minimize gastric distress.

References: 1. Boland, E. W., *J.A.M.A.* 160:613, (February 25,) 1956. 2. Margolis, H. M. *et al*, *J.A.M.A.* 158:454, (June 11,) 1955. 3. Bollet, A. J. *et al*, *J.A.M.A.* 158:459, (June 11,) 1955.

'CO-DELTRA' *and* 'CO-HYDELTRA' *are the trademarks of* MERCK & CO., INC.



These are your Interest Coupons

These coupons can be presented for collection or cashed at your local bank as the interest comes due. When these coupons are detached from the bonds they become in effect checks drawn on the municipality. These coupons (or checks) represent interest which is paid by the municipality for the use of your money.

Reprinted from "Municipal Bonds and You" our colorful sixteen-page book that is available to you Free!

Name________________________________

Address______________________________

City____________________ State________

MM-8-6

JURAN & MOODY, INC.

Municipal Bonds Exclusively

Rand Tower
MINNEAPOLIS 2

93 East 6th St.
ST. PAUL 1
TELEPHONE: CApital 4-9661

Citizens and Southern Building
ATLANTA, GA.

Clear-headed awakening —

usually follows restful sleep when you give your patients Elixir Alurate. It offers a wide margin of safety... prompt onset... pleasing taste. Available as cherry red Elixir Alurate or emerald green Elixir Alurate Verdum. Each teaspoonful contains 40 mg Alurate® - brand of aprobarbital.

Hoffmann - La Roche Inc • Nutley • N.J.

Challenge :Infection

Choice :Gantrisin

When you are confronted with a common infection, Gantrisin may be your first choice of an antibacterial because this single sulfonamide offers:

- effective action against a broad spectrum of microorganisms;
- high solubility in body fluids over a wide pH range;
- excellent tolerance with minimum risk of renal damage or sensitization.

Gantrisin® - brand of sulfisoxazole

'Roche' | Original Research in Medicine and Chemistry

MSD

MERCK SHARP & DOHME

DIVISION OF MERCK & CO., INC.

In name

as well as

in fact

On August 1, 1956, Sharp & Dohme, the pharmaceutical and biological division of Merck & Co., Inc., adopts the name "Merck Sharp & Dohme" and a new trademark to reflect the teamwork which has already produced significant new medical products. • Developing modern medical products and making them widely available requires teamwork of the highest order in research, production, and distribution. The desire to achieve this unity of effort prompted the merger of Merck & Co., Inc., and Sharp & Dohme, Inc., three years ago. • Merck Sharp & Dohme—combining in name as well as in fact the traditions and experience of two time-honored leaders in the medicinal field—offers bright promise for further advances in helping physicians conquer disease.

MSD

MERCK SHARP & DOHME
Pharmaceuticals • Biologicals
Division of Merck & Co., INC.
Philadelphia 1, Pa.

A MODERN
PRIVATE
SANITARIUM

for the
Diagnosis, Care
and Treatment
of Nervous
and Mental
Disorders

MAIN BUILDING—One of 10 Units in "Cottage Plan"

ST. CROIXDALE ON LAKE ST. CROIX

PRESCOTT, WISCONSIN

Located on beautiful Lake St. Croix, 18 miles from the Twin Cities, it has the advantages of both City and Country. Every facility for treatment provided, including recreational activities and occupational-therapy under trained personnel. Close personal supervision given patients, and modern methods of therapy employed. Inspection and cooperation by reputable physicians invited. Rates very reasonable. Illustrated folder on request.

Prescott Office
Prescott, Wisconsin
Howard J. Laney, M.D.
Tel. 39 and Res., 76

Consulting Neuro-Psychiatrists
Hewitt B. Hannah, M.D., Andrew J. Leemhuis, M.D.
527 Medical Arts Bldg., Tel. FE. 2-1357, Minneapolis, Minn.

Superintendent
Ella M. Leseman
Prescott, Wisconsin
Tel. 69

New STEELINE Pediatric Table

Eases the burden of the physician's daily work

Includes built-in tare balance scale, built-in measuring rod, foam rubber cushion and electrical outlets with cord and plug—there are no accessories to buy. Top quality construction features include all-welded steel body, two roomy drawers and a large open compartment with shelf, providing easy, access to instruments and supplies. Front edge is protected from wear by a stainless steel baffle plate. Despite the fact that this new table has been designed to provide the physician with the best modern equipment, efficient modern production methods in our own factory permit us to keep the price well below that of comparable models. Write today for complete information.

a. s. aloe company OF MINNESOTA
927 Partland Avenue, Minneapolis 4, Minn. • Phone:

new Peach-flavored, peach-colored, newest liquid form of the established broad-spectrum antibiotic . . . TERRAMYCIN®†
125 mg. per 5 cc. teaspoonful;
specially homogenized for rapid absorption;
bottles of 2 fl. oz. and 1 pint, packaged ready to use.

delightful peach taste in broad-spectrum therapy

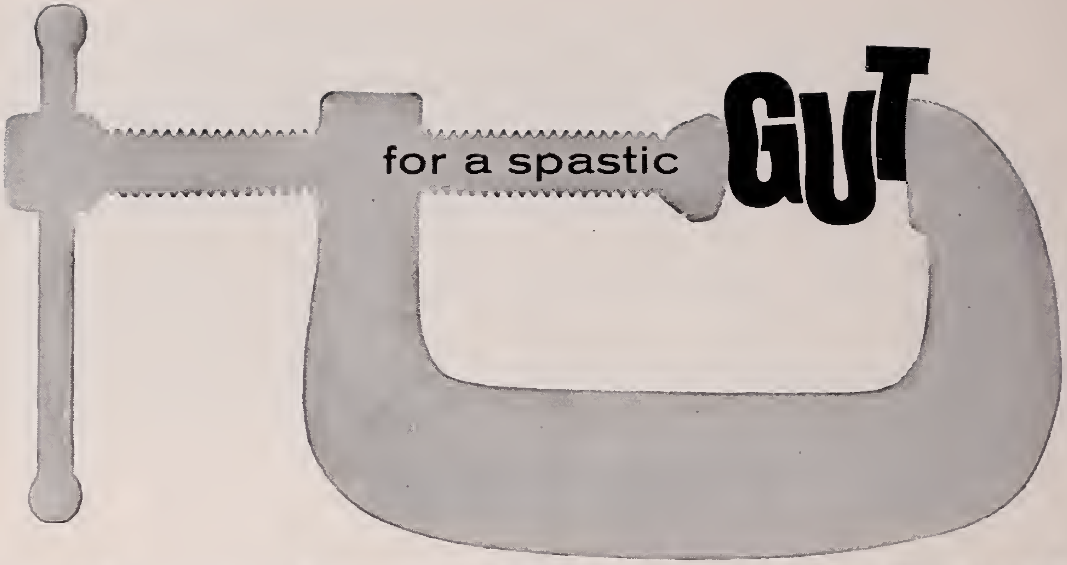
TERRABON®

BRAND OF OXYTETRACYCLINE

HOMOGENIZED MIXTURE

PFIZER LABORATORIES, *Division, Chas. Pfizer & Co., Inc.*, Brooklyn 6, N. Y. *Pfizer*

†Brand of oxytetracycline



Trasentine®-Phenobarbital

integrated relief . . .
mild sedation
visceral spasmolysis
mucosal analgesia

C I B A
Summit, N. J.

TABLETS *(yellow, coated), each containing 50 mg. Trasentine® hydrochloride (adiphenine hydrochloride CIBA) and 20 mg. phenobarbital.*

2/2228M

---

for your complete insurance needs . . .

☆ **PROFESSIONAL**
☆ **PERSONAL**
☆ **PROPERTY**

CHOICE OF THE MINNESOTA MEDICAL ASSOCIATION FOR PROFESSIONAL LIABILITY INSURANCE

ST. PAUL FIRE AND MARINE CO • ST. PAUL MERCURY INDEMNITY CO • MERCURY INSURANCE CO •
The Saint Paul Companies
SINCE 1853
INSURANCE
LAND • SEA • AIR

THERE IS A SAINT PAUL AGENT IN YOUR COMMUNITY
AS CLOSE AS YOUR PHONE

HOME OFFICE: 111 WEST FIFTH STREET, SAINT PAUL 2, MINNESOTA

The Importance of Rescinnamine in

Rauwiloid®

The Original Alseroxylon Fraction of India-Grown Rauwolfia Serpentina, Benth.

The isolation of rescinnamine,[1] another potent alkaloid in Rauwolfia serpentina, has substantiated two important points:

A—It discredits the erroneous opinion that reserpine is *the* sole active principle of Rauwolfia;[2]

B—It helps to define the advantages of Rauwiloid, the alseroxylon fraction of Rauwolfia serpentina, which presents desirable alkaloids[3] of the Rauwolfia plant (among them reserpine and rescinnamine) but is freed from undesirable alkaloids and the dross of the crude root.

Pharmacologic and clinical evaluation has shown rescinnamine to be similar to reserpine in antihypertensive activity, but to be considerably less sedative and much less apt to lead to lethargy and mental depression.[4, 5]

The interaction of reserpine, rescinnamine, and other contained alkaloids may well account for the balanced and desirable clinical behavior of Rauwiloid.

The dosage of Rauwiloid is simple and definite: Merely two 2 mg. tablets at bedtime. For maintenance, one tablet usually suffices.

1. Klohs, M.W.; Draper, M.D., and Keller, F.: Alkaloids of Rauwolfia Serpentina Benth. III. Rescinnamine, a New Hypotensive and Sedative Principle, J. Am. Chem. Soc. 76:2843 (1954).
2. Cronheim, G.; Brown, W.; Cswthorne, J.; Toekes, M.I., and Ungari, J.: Pharmacological Studies with Rescinnamine, a New Alkaloid Isolated from Rauwolfia Serpentina, Proc. Soc. Exper. Biol. & Med. 86:120 (May) 1954.
3. Gourzis, J.T.; Sonnenschein, P.R., and Barden, R.: Alterations in Cardiovasculsr Responses of the Dog Following Rauwiloid, an Alkaloidal Extract of Rauwolfia Serpentina, Proc. Soc. Exper. Biol. & Med. 85:463 (Mar.) 1954.
4. Hershberger, R.; Hughes, W., and Dennis, E.: Clinical Results in the Treatment of Hypertension with Rescinnamine, Clin. Res. Proc. 3:71 (Feb.) 1955.
5. Smirk, F.H., and McQueen, E.G.: Comparison of Rescinnamine and Reserpine as Hypotensive Agents, Lancet 2:115 (July 16) 1955.

Riker

LOS ANGELES

Relax the best way
... pause for Coke

DRINK Coca-Cola
Work Refreshed
Coca-Cola

continuous quality
is quality you trust

DRINK
Coca-Cola
REG. U.S. PAT. OFF.

A Complete Orthopedic Fitting Service

PRESCRIPTION SERVICE BY CERTIFIED FITTERS AT
HOSPITAL—OFFICE—HOME

Camp Supports,
Identical Form Breasts,
Orthopedic Shoes,
Artificial Limbs,
Arms, Braces

For Men, Women and Children

RAY TRAUTMAN AND SON
410 Portland
FE 2-2339
Minneapolis 15, Minn.

because a diuretic
should be able to control
any degree of failure

PATIENTS IN FAILURE NEED AN ORGANOMERCURIAL

Certain diuretics are apt to mask the gradual onset of severe failure because they are effective only in the milder ambulatory cardiacs. The recurrent accumulation of fluid permitted by intermittent or arbitrarily limited dosage must eventually progress to more severe decompensation.

Because they can control *any* grade of failure, the organomercurials improve prognosis and prolong life.

TABLET
NEOHYDRIN®
BRAND OF CHLORMERODRIN (18.3 MG. OF 3-CHLOROMERCURI-2-METHOXY-PROPYLUREA EQUIVALENT TO 10 MG. OF NON-IONIC MERCURY IN EACH TABLET)

a standard for initial control of severe failure
MERCUHYDRIN® SODIUM
BRAND OF MERALLURIDE INJECTION

LAKESIDE

01358

APH
OMAHA
APC
OMAHA

the Emblems of RELIABLE PROTECTION

We cordially invite your inquiry
for application for membership
which affords protection against
loss of income from accident and
sickness as well as benefits for
hospital expenses for you and
all your dependents.

ALL PREMIUMS COME FROM PHYSICIANS SURGEONS DENTISTS ALL BENEFITS GO TO

$4,500,000 ASSETS
$23,800,000 PAID FOR BENEFITS
SINCE ORGANIZATION

Since 1902

**PHYSICIANS CASUALTY
AND
HEALTH ASSOCIATIONS**
OMAHA 2, NEBRASKA

NEW!
Patented HANSEN
Split Frame Truss

Positive Hernia Control

Contoured Spring Design Gives
Custom Made Comfort
Unlimited Body Activity
Single with Dummy Illustrated
Double not Illustrated

C. F. ANDERSON CO., INC.

901 Marquette
Minneapolis, Minnesota

Cook County Graduate School of Medicine
INTENSIVE POSTGRADUATE COURSES
STARTING DATES—SUMMER AND FALL, 1956

SURGERY—Surgical Technic, two weeks, September 17, October 29.
Surgical Anatomy and Clinical Surgery, two weeks, October 1.
Surgery of Colon and Rectum, one week, September 17.
General Surgery, one week, October 22.
Thoracic Surgery, one week, October 1.
Esophageal Surgery, one week, September 24.
Breast and Thyroid Surgery, one week, October 22.
Gallbladder Surgery, three days, October 29.
Fractures and Traumatic Surgery, two weeks, October 15.
GYNECOLOGY AND OBSTETRICS—Obstetrics and Gynecology, three weeks, October 22.
Office and Operative Gynecology, two weeks, September 17.
Vaginal Approach to Pelvic Surgery, one week, September 10.
MEDICINE—Electrocardiography and Heart Disease, two-week basic course, October 8; one-week advanced course, September 17.
Internal Medicine, two weeks, September 24.
Gastroscopy and Gastroenterology, two weeks, September 10.
Gastroenterology, two weeks, October 22.
Dermatology, two weeks, October 15.
Cardiology (Pediatrics), two weeks, November 5.
RADIOLOGY—Diagnostic X-ray, two weeks, September 17.
Clinical Uses of Radioisotopes, two weeks, October 8.
UROLOGY—Two-week course, October 8.
Cystoscopy, ten days, by appointment.

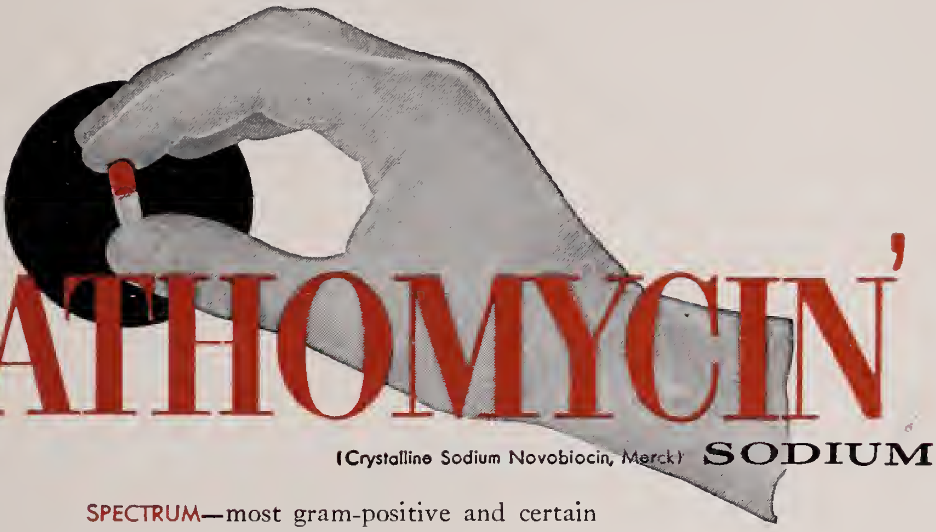
TEACHING FACULTY—ATTENDING
STAFF OF COOK COUNTY HOSPITAL

ADDRESS: REGISTRAR, 707 South Wood Street,
Chicago 12, Illinois

NOW AVAILABLE...

a unique new antibiotic
of major importance

PROVED EFFECTIVE AGAINST
SPECIFIC ORGANISMS
(staphylococci and proteus)
RESISTANT TO ALL OTHER
ANTIMICROBIAL AGENTS



'CATHOMYCIN'

(Crystalline Sodium Novobiocin, Merck) **SODIUM**

SPECTRUM—most gram-positive and certain gram-negative pathogens.

ACTION—bactericidal in optimum concentration even to resistant strains.

TOXICITY—generally well tolerated. This is more fully discussed in the package insert.

ABSORPTION—oral administration produces high and easily-maintained blood levels.

INDICATIONS—cellulitis, pyogenic dermatoses, septicemia, bacteremia, pneumonia and enteritis due to *Staphylococcus* and infections involving certain strains of *Proteus vulgaris*, including strains resistant to all other antibiotics.

DOSAGE—four capsules (one gram) initially and then two capsules (500 mg.) twice daily.

SUPPLIED—250 mg. capsules of 'CATHOMYCIN', bottles of 16.

'CATHOMYCIN' *is a trademark of Merck & Co., Inc.*

MSD
MERCK SHARP & DOHME
DIVISION OF MERCK & CO., INC.
PHILADELPHIA 1, PA.

new dimensions in the treatment of sev

broadens benefits

- rapid control of allergic sneezing, lacrimation, nasal congestion; relief of pruritus, edema and erythema
- up to 5 times more effective than oral hydrocortisone, milligram for milligram

narrows side effects

- minimizes incidence of fluid and electrolyte disturbance
- dietary regulation usually unnecessary

lengthens established gains

- permits a smoother, undisturbed regimen
- extends and maintains benefits to more patients

y fever and other difficult allergies...

METICORTEN*
(PREDNISONE)

or outstanding hormonal control
with minimal electrolyte disturbances

n hay fever and other respiratory allergies,
contact dermatitis and allergic eczemas,
drug and other allergic reactions,
allergic and inflammatory eye disorders

METICORTEN,* brand of prednisone. *T.M.
1, 2.5 and 5 mg. tablets. MC-J-3086

Schering

Schering
METICORTEN
PREDNISONE
SCHERING

prevents postpartum hemorrhage
speeds uterine involution

Lilly
QUALITY / RESEARCH / INTEGRITY

'Ergotrate Maleate'

(ERGONOVINE MALEATE, LILLY)

. . . produces rapid and sustained contraction of the postpartum uterus

'Ergotrate Maleate' almost completely eliminates the incidence of postpartum hemorrhage due to uterine atony. Administered during the puerperium, 'Ergotrate Maleate' increases the rate, extent, and regularity of uterine involution; decreases the amount and sanguineous character of the lochia; and decreases puerperal morbidity due to uterine infection.

Supplied:

Ampoules of 0.2 mg. in 1 cc.
Tablets of 0.2 mg.

DOSAGE: Generally, 0.2 to 0.4 mg. I.V. or I.M. immediately following delivery of placenta. Thereafter, 0.2 to 0.4 mg. three or four times daily for two weeks.

80TH ANNIVERSARY 1876 · 1956 / ELI LILLY AND COMPANY

659004

Original Contributions

The Physician and the Mentally Retarded Child

JACK V. WALLINGA, M.D.
Oakland, California

THE family physician is frequently the first person from whom help is sought by parents who suspect that their child may be retarded mentally. This problem, always difficult for the physician to deal with, may often appear insoluble, but there is actually much that can be done to help these parents and their children. Frequently, after an impression of retardation has been confirmed, institutional placement has been recommended as a solution. In a sense this is a solution, since it abruptly removes the child from the situation in which he is not adjusting and is creating discomfort in the family by his inadequacy or misbehavior; too often, however, the detrimental effects on the child of such a separation are overlooked or minimized. Undoubtedly more can be expected of the mildly, and even moderately, retarded child than has been previously thought possible.

From long experience in dealing with mentally retarded persons, some outmoded points of view toward these individuals have been retained. The undeniable limitations presented by these children have encouraged custodial care. In the past, the retarded child faced overwhelming pressures in the school and community, pressures so great that removal from his home to an institution often seemed to be the only alternative. In addition, there has been a need for the public to be made more aware of the problems of the mentally retarded; one way to accomplish this was to stimulate greater public demand for adequate facilities for this group.

More recently the pendulum has swung the other way. Public awareness and acceptance of custodial care for the mentally retarded are high. Many good institutions exist or are being planned, with much better standards of care and training offered to children committed to such schools. Yet facilities still do not meet the demand, and long waiting lists for admission are common. We can never hope to provide custodial institutional care for the entire 2 per cent of the population classified as mentally retarded. Also, mental deficiency is not a problem for which we hope to find effective therapy or even substantial preventative measures, but one which will continue to be with us in proportion to the population. On the other hand, the persistent focus on mental inadequacy ignores the social capacity and potential of the retarded child, and the overdependency on intelligence tests often blinds us to more important hopeful aspects of their behavior. Too often there is found in this field little attempt at diagnosis and less at treatment, with the result that thousands of children are still being scrapped each year with the poorly-defined label of mental deficiency.[1]

In Minnesota, an intelligence quotient (I.Q.) of 70 generally qualifies a child as eligible for commitment to a state school for the mentally retarded. On occasion children with I.Q.'s of as much as 90 have been accepted when they were particularly maladjusted in their home environment by virtue of acting like retarded children. Of the mentally retarded group, three-fourths are mildly retarded and another one-fifth are moderately so;[2] thus the large majority of the retarded are not severely handicapped basically and are potentially capable of learning to make a fairly adequate adjustment if other factors are favorable. The child who is intellectually below normal is nevertheless a growing, sensitive, responsive child. Every aspect of his developing personality is subject to early training so that he may compensate to a considerable extent for his intellectual deficiency.

Dr. Wallinga is Lieutenant Commander, MC, USNR, Neuropsychiatric Service, U. S. Naval Hospital, Oakland.
The opinions or assertions contained herein are the private ones of the author and are not to be construed as reflecting the views of the Navy Department or the Naval Service at large.

We are not referring here to the very severely and grossly retarded child (I.Q., below 20-30), whose retardation is readily apparent from infancy, nor to those children who, in addition to severe mental retardation, have severe physical handicaps which materially complicate their possible adjustment. These children are not educable, often are not trainable, and much less is gained by not placing them in custodial institutions early.

A major problem in this whole area is that of accurately and validly measuring intelligence. The I.Q. reflects ability to learn abstract and verbal subject matter. It does not measure practical, mechanical, mathematical, musical, artistic, social, or other abilities and aptitudes that require special kinds of intelligence; nor does it reveal common sense which may be extremely important in ultimate adjustment. Other capacities of the child which cannot be measured by psychometric tests, but which may be very important in the final personality adjustment, include emotion, temperament, motility, shrewdness, insight, originality, and resourcefulness.[1] In much the same manner as tested "genius" is only a potential which may never be reached, so is retardation a potential which the individual may far exceed.

The intellectual level cannot be measured accurately until the third or fourth year when a child usually has developed adequate communication. With the unhappy, withdrawn, or emotionally disturbed youngster, sufficient communication may not be possible even at this age. Unfortunately it is frequently of this child that an intelligence evaluation is especially desired.

Some inconsistency exists in the comparison of degrees of retardation according to the psychologic test used. The I.Q. results are not equivalent on different tests and therefore have different meaning. The World Health Organization's Joint Expert Committee on the mentally subnormal child has suggested[2] that the lower limit of mild retardation be more conservatively placed at six-year performance in comparison with adult standards, and that of moderate retardation, at the two-year level rather than at ages eight and three, respectively, as at present.[3] An I.Q. of 50 (mental age eight years) theoretically permits completion of the third grade in school, and an I.Q. of 90 (mental age fourteen) permits completion of the eighth grade, yet we see many youngsters of this latter intellectual level entering and even graduating from high school.

The role that emotional conflict plays in lowering an individual's functioning intellectual capacity deserves wider recognition. Severe personality disturbance resulting from emotional deprivation may produce irreversible intellectual impairment. How often does this occur when a young child, believed to be retarded, is separated from its parents and placed in an institution for care and training?

The maturation process may be fostered or restricted by the wealth or proverty of stimulation in the environment during the child's early formative years. Transfer from a stagnant to an inspiring, stimulating environment may improve I.Q. results ten to twenty points by stirring latent potentialities to full fruition and providing greater emotional stability. Pearson[4] was unable to delineate clearly a diagnostic syndrome of severe intellectual inhibition from emotional causes, but nevertheless believed there are a number of such children diagnosed as mentally deficient who, if their emotional problems were treated, would have a much better prognosis. Pseudoimbecility also has been described as a not infrequent psychologic mechanism through which children gain considerable satisfaction.[5] It seems to be generally recognized that intellectual inhibition from emotional disturbance may frequently produce a reversible picture of mental retardation, but this is not as often applied in individual cases as might be done. In most specialized treatment settings where this diagnostic clarification could be pursued, there are so many more alert, responsive children, who need and can readily use the time of overtaxed and limited staffs, that little effort is directed toward the apparently retarded child. A few hours' observation in a clinic, or even a few days' study in the hospital, does not usually allow these children to reveal their true potential.

Also deserving of more consideration than it has been given is the longitudinal variability of the I.Q. score a child achieves. A recent study suggested that normal fluctuation of the tested I.Q. is much wider than previously thought.[6] Of a group of 140 average children followed from infancy to age fifteen with repeated social and psychologic re-evaluations, the thirty-five children with the greatest I.Q. gain showed increases ranging from eighteen to fifty-seven points, and the thirty-five showing the greatest loss decreased from ten to twenty-seven points. One possible cause for this marked variability was thought to be subclinical, free-floating anxiety which may have a devastating effect on a child's test performance; and this is not recognizable by the examiner who spends only a few hours or at most a day or two with the child. It is also observed in this study that the developmental pattern and progress of the young child is not necessarily correlated with the final intelligence level and, together with early I.Q. evaluations, may be quite misleading.

A most unfortunate consequence of early institutional placement of retarded children is the retarding effect itself of removing a young child from its parents and its home to a permanent institutional environment. Whether intellectually normal or deficient, the institutionalized child usually presents a pathetic picture of listlessness, immobility, and unresponsiveness to personal relationships. His facial expression is fixed, and with an unhappy, distant look his attitude repels the environment.[1] An infant needs to be the center of a family group to receive a sufficient amount of the individual affectionate stimulation so important for healthy emotional development. No young child can thrive on communal living with many varied and inconsistent parent-figures. With gross emotional deprivation, first, socialization suffers, then language intelligence functioning, and finally, adaptive development. In infants institutionalized for three months, the developmental quotient is observed to fall to 65 per cent, and to 50 per cent for those isolated for a year.[1] An inadequate environment may keep a child mentally in the dark as much as a visual or auditory handicap which interferes with learning. It is not surprising that usually these institutionally-reared children fulfill the pessimistic expectations held for them, that is, they continue to function in a grossly retarded pattern. Marked mental retardation suggests an unfavorable eventual prognosis, yet an intensive medical, psychologic and educational program will overcome some of the deviation. Even some apparently hopelessly retarded children may be helped to develop a special aptitude in some field; otherwise institutionalization is inevitable. Institutional placement should be reserved for the very retarded child who requires indefinite physical care and who obviously will never be able to care for himself or make any significant contribution to the community. Such a decision calls for careful consideration. A defeatist attitude only impedes the development of the child's latent potentialities. The ultimate adjustment of the retarded individual will depend to a large extent on the individual attention received in childhood from its mother in regard to those aspects of deficiency most amenable to improvement; and this is best accomplished in an accepting, affectionate, emotionally satisfying home environment.

The Armed Forces, at present, generally accept men with an I.Q. as low as 65 if they are literate and emotionally stable. Some individuals even below this level are satisfactorily utilized in the service. During World War II when marginal manpower was more fully utilized, men with a mental age of eight years (I.Q., 50) were used in overseas operations while others with even lower ability functioned adequately in less demanding situations. This suggests the role that is possible for the moderately and mildly retarded individual in our society.

In a recent study,[7] a group of young, moderately retarded individuals (Stanford Binet I.Q.'s ranging from 24 to 41; mean I.Q., 33) were found able to reach and maintain unexpectedly high levels of achievement when suitably trained. It was observed that although the initial ability of those studied was exceedingly low, ability had little relationship to the level they achieved with training, and the main distinction between their performance and that of normal individuals was not so much the final level of achievement as the time required to achieve it. After adequate training these individuals, with minimal supervision, could do a full day's work reliably and well, and gave every appearance of enjoying their activity. The work problems used in this study included such tasks as soldering television components, assembling bicycle pumps and cutting insulated wire to exact length. It was noted that although some of the group could not name colors correctly, all could match them.

Kugelmass[1] has given an excellent review of causative factors to be considered in evaluating a retarded child, as well as a thorough discussion of helping the parents with their feelings and subsequent care and training of the child. A few points will be stressed here.

Parents are generally reluctant to accept the fact of their child's retardation even though they have usually had some awareness, at least subconsciously, of it previously. Many will flatly deny the doctor's diagnosis. Bringing into the open the child's retarded status also elicits a strong emotional reaction from the parents. If this is not anticipated and the parents prepared adequately to face what they often construe as their failure, they may simply reject the diagnosis and leave the doctor to seek help and consolation from some other source less qualified but more reassuring and acceptable to them. Learning that their child is retarded may also precipitate marked feelings of hostility toward the child, or toward the other parent for his or her part in creating such a child. Parents often develop intense guilt feelings which lead them to seek endlessly for a "cure," or to spend money far beyond their resources to help the child toward impossible goals, in an effort to assuage their guilt. They may be so overwhelmed with guilt that they cannot conceive of institutional placement for the child no matter how totally incapacitated he may be. They dedicate the rest of their life to caring for and overindulging the retarded youngster, often to the detriment of the child as well as the rest of the family. Other parents will project their anger on to the retarded child and seek placement eagerly, then later suffer guilt feelings when they realize how they have totally rejected their child. Placement is essentially a rejection of the unwanted, retarded child despite rationalizations which may be offered of his receiving better physical care in the institutional setting, experiencing fewer demands from his peer group, enjoying a more relaxed environment, or having better and longer protection and security. Once the child is placed, some parents such as these prefer to live as if they had never had a retarded child; they don't visit or speak of him at home, and they are not able to accept him back into the family group. This latter problem does not often arise, though, as long term placement usually leads to the youngster developing a strong dependence on the institutional environment in which he was reared and he strongly resists leaving it to reenter society, even when able.

Parents will want to know why their child is slow, both medically and, on a deeper philosophic level, why this had to happen to them. It may be related by them to past misdeeds or thoughts about which they still feel guilty and for which the retarded child is interpreted as punishment. Such deep-seated psychologic problems will not be verbalized early but only after parents acquire great confidence in their doctor. Establishing the diagnosis is only a first step and the physician's role cannot stop here. The help and support that the parents of the retarded child need cannot possibly be given at the time the diagnosis is made. When the physician attempts to deal with as complex a problem as a retarded child in an interview or two with the parents, it may well reflect his own discomfort with this type of problem. If left undiscussed and unresolved, their questions will lead to intrapersonal and family conflict. Parents often wonder about the probability of retardation in subsequent children and how siblings should be handled with respect to the retarded member of the family. They need continued opportunities to talk about the difficulties their child is presenting as well as the progress he is showing. As they are confronted with new situations, the parents will experience new feelings and reactions which they may not understand and which will require interpretation. They continually need help in accepting the child as a handicapped member of the family and in treating him as an equal in accordance with his mental age. This is a problem not unlike that presented by the child severely handicapped physically and his subsequent adjustment in the home and community. It must be realized that parents can never be really objective about their own child, particularly when he has a special health problem. Although the mentally retarded present additional problems of education and socialization, it is to their ultimate benefit, as well as that of their family and community, that they be helped to stay at home and maintain a happy adequate adjustment there. Home care of retarded children undeniably presents some problems in addition to those encountered in raising a normal child. Neighbors and friends will stimulate concern about the child's not performing up to expectations for his age. More adequate playmates and siblings may tease him, with the result that he may become sensitive and withdrawn or aggressive and defiant. Some retarded children will become rather severe behavior problems and even delinquent. But it is completely erroneous to attribute such behavior to the intellectual retardation; average and superior children also become delinquent. These problems and the children who present them are all potentially responsive to adequate treatment.

For the retarded child to adjust well at home a genuine acceptance by his parents is essential. Parents often require help to free them of the emotional conflicts which prevent them from giving him the satisfying family ties he needs.

(Continued on Page 520)

Sigmoido-perineal Fistula from Diverticulitis of the Sigmoid Colon

HOWARD M. FRYKMAN, M.D.
Minneapolis, Minnesota

THIS case report presents an unusual complication of colonic diverticulitis with a sigmoido-perineal fistula leading from the sigmoid colon to a cutaneous opening lateral to the anus. At the 1954 meeting of the American Proctologic Society, a similar case was presented by J. R. Hill[11] of the Mayo Clinic. In a personal communication he indicated that he had never seen a similar fistula at the Mayo Clinic. During the discussion of Hill's paper Scarborough[12] presented two additional cases. In 1951 Patterson[1] reported two colo-perineal fistulas in sigmoidal diverticulitis. Swinton[8] gives reference to perineal fistulas with diverticulitis, in some of which abdominal-perineal resection with permanent colostomy had been required to cure the disease. Many more cases of this type of complication of diverticulitis must have occurred which have not been reported, or were overlooked in reviewing the literature.

Perineal fistulas secondary to diverticulitis are relatively rare because of the barrier produced by the endopelvic fascia and the pelvic diaphragm. Infection with abscess formation will take the path of least resistance which accounts for the greater incidence of fistulous communication between adjacent hollow viscera and cutaneous fistulae to the abdominal wall.

It has been estimated that 5 to 10 per cent[5] of all individuals over the age of forty have diverticulosis of the colon as demonstrated by contrast barium enema, with about 80 to 85 per cent of these diverticula confined to the sigmoid colon. Colcock[3] believes that at some time in their lives all people with diverticulosis will have some degree of diverticulitis. In about 15 to 20 per cent[6,7] this diverticulitis is recurrent and severe enough to produce clinical symptoms. Various published estimates also indicate that between 15 to 20 per cent of patients with recurrent attacks of diverticulitis will ultimately develop complications requiring surgical intervention.

Diverticulitis produces numerous intra-abdominal complications, but because the inflammation occurs predominantly in the distal colon, most of the pathological findings are limited to the pelvis and lower abdomen. Perforation of infected diverticuli with localized abscess formation is one of the most common complications. In many cases the abscesses subside, apparently by re-perforation back into the colon. In others the abscess will continue to enlarge and may give rise to fistulous communications with any of the adjacent organs, but most frequently the bladder. Mayo and Blunt[2] recently reported 22.8 per cent of 202 proven cases of diverticulitis to have sigmoido-vesical fistulae. Cutaneous fistulae to the abdominal wall are also quite common and were the indications for surgery in 14 per cent of the cases reported by both Mayo and Blunt[2] and by Colcock.[3]

Case History

J. A. A., a fifty-two-year-old white man, a welder by trade, gave a history of intermittent attacks of diverticulitis of the sigmoid colon for the past seven years. About six months after the onset of his symptoms an exploratory laparotomy was done in New Orleans, at which time a ruptured sigmoid diverticulum with localized abscess was found. The perforation was closed and the abscess drained through the lower midline abdominal incision. A fecal fistula developed at the site of drainage, which persisted for several months before closing spontaneously.

Since that time he had had repeated febrile episodes associated with diarrhea and crampy abdominal pain. About four years after the onset of his illness rectal pain became a prominent feature of his exacerbations. A feeling of pressure and dull pain in the rectum was associated with the passage of large amounts of mucus, which was often blood tinged. In October, 1953, he developed a large pararectal abscess which extended well out into the right buttock. On digital examination the superior limit of the abscess could not be reached. His local doctor incised and drained the abscess with a wide skin incision to attempt to create a cylinder. Soon after the incision and drainage the patient began to notice flatus escaping through the external fistulous opening,

---

Presented before the Minneapolis Surgical Society, October 6, 1955.

along with large amounts of stool-stained purulent material. The passage of intestinal gas through the lateral sinus had been persistent since its onset.

Examination of this muscular white man revealed all of the abnormal physical findings to be limited to the lower abdomen and the anorectal regions. A lower midline abdominal scar was present with a small ventral hernia. The lower abdomen was tender to deep palpation but no masses could be felt. A fistulous opening was present about 5 cm. to the right of the anus, through which a probe could be passed upward, parallel to the rectum, for about 15 cm. A smooth indurated mass was palpable through the posterior wall of the rectum and the rectal mucosa appeared quite red and edematous in this area. On sigmoidoscopy some puckering of the mucous membrane was seen on the posterior wall of the sigmoid colon at 18 cm., but no fistulous opening could be found. Acute angulation of the bowel to the right prevented passage of the instrument above this level.

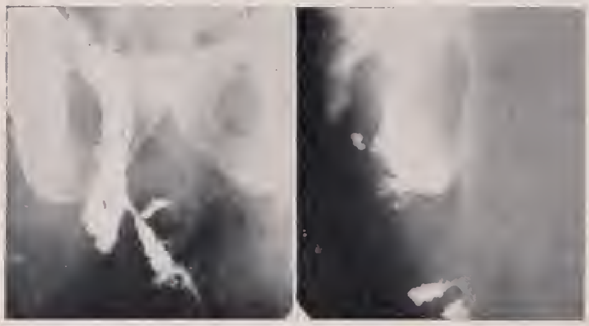


Fig. 1. *(left)* Anterior-posterior roentgenogram with lipiodol injected into the large irregular fistulous tract leading from the sigmoid colon to the perianal skin. The large posterior pocket is partially filled with the contrast media.

(right) A lateral view showing the large flasked-shaped cavity posterior to the rectum which communicated with the superior portion of the main fistulous channel.

X-ray studies of the fistulous tract and the colon were done which were reported as follows: "Lipiodol injection of the fistula to the right of the anus shows a large irregular fistulous tract (Fig. 1) which runs up parallel to the rectum for a distance of about five inches with several irregular pockets present. One large pocket filled medially and posterior to the rectum. A barium enema was then done which showed the rectum to be normal in appearance. There is marked irregularity and narrowing of the distal sigmoid with the sigmoid deviating toward the right rather than to the left. This segment of the sigmoid colon is quite rigid and seems to be fixed in this position. A few diverticula are also seen in this area. This is apparently the site of communication between the fistulous tract and the colon (Fig. 2). The sigmoid colon is long and redundant but the remainder of the colon shows no abnormalities."

After adequate preparation of the colon with sulfathalidine and neomycin, the patient was operated upon on January 4, 1954. Exploration of the peritoneal cavity revealed a long redundant sigmoid colon bound down to the pelvic floor by dense scar tissue. Dense adhesions were also present between the sigmoid colon, the base of the bladder and the small bowel. The diverticulitis involved about 10 cm. of the distal sigmoid which was markedly indurated and fibrotic, and was kinked upon itself to the right of the midline. This segment was the site of origin of the fistulous tract. After releasing the adhesions and adequate mobilization, the area of diverticultis and most of the redundant sigmoid was resected. An open end-to-end anastomosis was done at about 5 cm. above the peritoneal reflection without complementary colostomy. The fistulous opening in the pelvic floor was closed by mobilizing the adjacent pelvic peritoneum. The patient made an uneventful recovery and was discharged from the hospital on the seventh postoperative day.

The pathologist's report was as follows: "The specimen consists of a segment of sigmoid colon measuring 36 cm. in length. The mucosa shows no evidence of ulceration or tumor, but a segment of the wall is indurated and a perforation is present which apparently starts in a diverticulum. The fatty tissue surrounding the area of perforation is discolored and markedly indurated. Several diverticula are present adjacent to the perforation. Sections of the sigmoid colon showed the fistulous tract to be lined by granulation tissue composed of a dense infiltrate of both acute and chronic inflammatory cells and newly formed capillaries. Sections of the regional lymph nodes show no evidence of specific inflammatory reaction. No evidence of malignancy was found. Conclusions: Fistulous tract from sigmoid colon secondary to diverticulitis. Hyperplastic lymphadenitis."

Following the segmental resection of the sigmoid colon the general condition of the patient rapidly improved. His abdominal symptoms disappeared completely and bowel movements became normal and regular. However, the discharge from the fistula lateral to the anus continued. Large amounts of purulent material oozed from the fistulous opening with each bowel movement, which the patient estimated at times to be "at least a half a cupful." On examination the perineal fistula appeared unchanged and again readily admitted a probe for about 15 cm. The smooth, indurated and boggy area was still palpable through the posterior rectal wall. This represented the large pocket posterior to the rectum which had been demonstrated by x-ray (Fig. 1). Digital pressure over this mass caused pus to exude from the external fistulous opening. On sigmoidoscopy the site of anastomosis at about 16 cm. was found to be well healed and adequate, and no other pathology was seen to 25 cm. Culture of the pus from the fistula showed the predominant organism to be *Proteus vulgaris*, with slight sensitivity to chloromycetin and neomycin and complete insensitivity to all other antibiotics.

It was felt that failure of the fistula to heal spontaneously following the resection of the sigmoid colon was due to the large pocket posterior to the rectum preventing adequate drainage, plus the presence of the insensitive *Proteus* organisms.

Excision of the extensive sinus tract was done on June 14, 1954. This required a large posterior horse-shoe shaped incision extending around the entire anus except for a small bridge of skin anteriorly. The anococcygeal tendon was divided and the rectum mobilized from the hollow of the sacrum to open the large posterior pocket containing about 30 cc. of pus. Dense scar, in many places one-half inch thick, formed the wall of this portion of the fistula. The posterior pocket was found to communicate with the main channel of the lateral fistulous tract near its superior end, or nearly 5 inches from the external opening. The external skin was sacrificed laterally to both ischial tuberosities and posteriorly to the coccyx. The ischiorectal fat, and the posterior portion of both levator muscles were also excised creating a large wound to facilitate healing. Superiorly it was necessary to mobilize the rectum up to the promontory of the sacrum in order to excise the uppermost portion of the sinus. The entire rectum, including the sphincter mchanism and a narrow margin of perianal skin, was retracted anteriorly as far as possible and the large caviety packed with dry gauze. The packing was removed under anesthesia on the fourth postoperative day. The cavity healed quite rapidly and three months following the operation was completely and solidly healed.

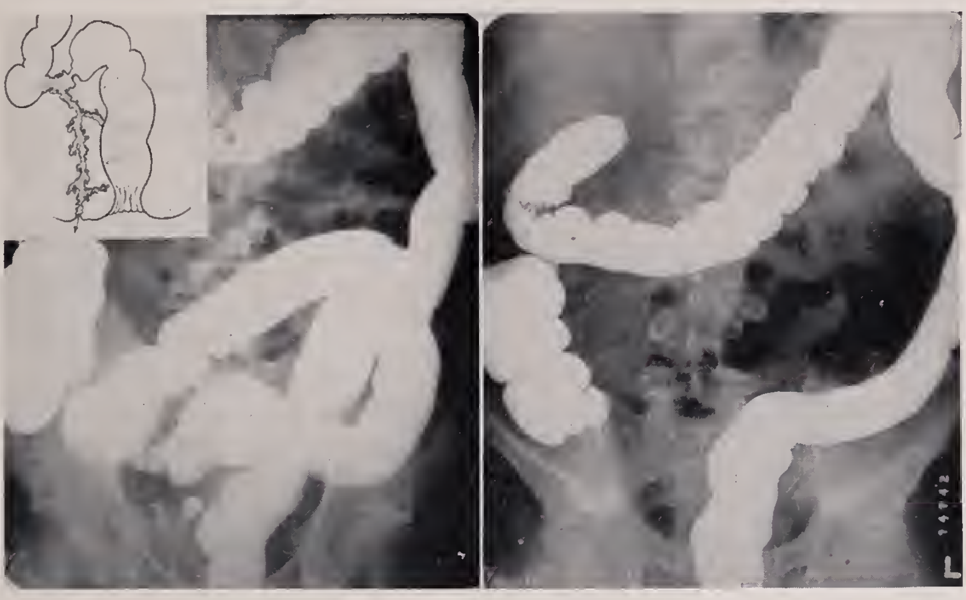


Fig. 2. *(left)* Barium enema showing diverticulitis of the distal sigmoid colon with the fistulous tract visible to the right of the rectum. The insert shows the artist's conception of the complete sigmoido-perineal fistula.

(right) Barium enema study following segmental resection of the sigmoid colon and the extensive perineal dissection to eradicate the fistulous tract.

Comment

This case of sigmoido-perineal fistula secondary to diverticulitis was treated by a one-stage resection and anastomosis of the sigmoid colon without complementary colostomy. The usual practice in patients with diverticulitis complicated by fistula formation has been to completely divert the fecal stream by transverse colostomy. A waiting period of several months has then been advocated before attempting to resect the diseased colon and eradicate the fistulous tract. With the use of antibiotics and adequate intestinal antisepsis many of the dangers inherent in sigmoid resections for diverticulitis have been greatly reduced. Recently Boyden,[4] Mayo,[2] Moore,[9] Donald,[10], Welch, Allen and Donaldson,[14] and many others have advocated re-evaluation of this surgical problem and have recommended a much bolder approach. These men feel that the indications for surgery in diverticulitis should be extended, and that in most cases primary resections can be accomplished, with or without complementary colostomy, depending upon the individual findings at the time of surgery.

An attempt has been made to reduce the morbidity and lessen the economic cost to the patient by eliminating months of preliminary colostomy in those cases in which it is not a necessity. There is quite general agreement that a diverting colostomy should be done in the presence of obstruction or with acute perforating inflammatory masses. The second stage resection and anastomosis, however, can be readily accomplished within a few weeks, rather than waiting for months as had been previously recommended. It must be emphasized that in primary resections with anastomosis, a wide excision of the bowel must be done, with mobilization of the splenic flexure if necessary, in order to anastomose healthy bowel without tension. If there is any doubt as to the integrity of the anastomosis, a complementary transverse colostomy should be done. The procedure chosen should depend entirely upon the conditions presented in each individual case. Attempts to standardize stagesaving operations for all patients can be very hazardous.

It is usually not necessary to excise the fistulous tract in cutaneous fistulas secondary to diverticulitis. After the deep end of the fistula has been separated from the diseased bowel by the colon resection, the sinuses will usually close spontaneously, becoming converted into inactive fibrous cords. In the case reported a large flask-shaped chronic abscess cavity was present, with the neck of the flask pointing upward, and communicating with the superior portion of the main fistulous channel. This pocket made adequate drainage impossible and prevented the sinus from healing. The fistula was further complicated by a secondary infection with insensitive *Proteus vulgaris* organisms. An extensive perineal dissection was necessary to accomplish the fistulectomy and eradicate the sinus.

Until recently the treatment of diverticulitis has generally been considered to be a medical problem with surgery being reserved for the complications, which include perforation, obstruction, hemorrhage and fistulous communication with adjacent hollow viscera or the skin. Another definite indication for surgery is the inability to clinically differentiate diverticulitis from carcinoma. In the past few years many authors[3,4,6,13,14] have discarded this ultraconservative view of the past and have considered severe uncomplicated diverticulitis to be an important indication for surgery. This attitude has developed only recently since the advent of antibiotics and adequate intestinal antisepis and has not yet been generally accepted. Repeated attacks of diverticulitis can be a real hazard to the life of the patient and the longer the symptoms persist the greater is the possibility of serious complications. Since the incidence of complications in recurrent colonic diverticulitis is 15 to 20[6,7] per cent, it is often wiser to recommend corrective surgery early rather than wait for trouble to develop. Attacks of diverticulitis are also disagreeable and disabling to the patient and require indefinite adherence to a strict medical regimen. As in other conditions, such as cholecystitis, there is little reason for the patient to tolerate this hazard, discomfort and inconvenience unless serious contraindications are present. Resection of the sigmoid colon can be as curative in recurrent sigmond diverticulitis as cholecystectomy is with recurrent cholecystitis. The operation should be done as an elective procedure when the inflammatory process is quiescent, and with adequate preparation, resection and anastomosis can usually be accomplished without the necessity of a temporary proximal colostomy.

As longevity increases, with the tendency toward sedentary habits and chronic constipation, the incidence of colonic diverticulosis and diverticulitis can also be expected to increase. Interval elective resection of the sigmoid colon for severe uncomplicated diverticulitis will also become more popular in the future.

Summary

This case report presents an unusual complication of diverticulitis of the sigmoid colon with a sigmoido-perineal fistula opening lateral to the anus. Treatment consisted of a primary resection and anastomosis of the sigmoid without complementary colostomy. An extensive perineal dissection was necessary several months following the colon resection in order to eradicate the persistent fistulous tract. Failure of the sinus to heal spontaneously was due to a large pocket providing inadequate drainage, plus infection with insensitive *Proteus vulgaris* organisms.

Comment is made on the recent re-evaluation of the problem of surgical treatment of colonic diverticulitis. Severe uncomplicated diverticulitis should be considered an important indication for surgery. With the use of antibiotics and intestinal antisepsis selected cases of diverticulitis complicated by fistula formation may also be treated with primary resection and anastomosis.

References

1. Patterson, C. O.: Diverticulitis of colon. Gastroenterol., 18:201-206 (June) 1951.
2. Mayo, C. W., and Blunt, C. P.: Surgical management of complications of diverticulitis of the large intestine. S. Clin. North America, 30:1005-1012 (Aug.) 1950.
3. Colcock, B. P.: Surgical treatment of diverticulitis. S. Clin. North America 30:911-917 (June) 1950.
4. Boyden, A. M.: The surgical treatment of diverticulitis of the colon. Ann. Surg., 132:94-109 (July) 1950.

(Continued on Page 526)

Nervous System Findings Associated with Systemic Lupus Erythematosus

EDWARD C. CLARK, M.D.
ROBERT E. YOSS, M.D.
Rochester, Minnesota

In recent years, assisted by the Hargraves L.E. cell test, clinicians have been diagnosing systemic lupus erythematosus with greater frequency than formerly. Contributing to the increased awareness of this disorder has been the recognition that lupus erythematosus may involve multiple organ systems of the body.[1] Among these is the nervous system.

While it has been known for many years that neurologic and psychiatric manifestations might occur in this disorder, it has generally been assumed in the past that they were infrequent terminal events. It is true that such neurologic and psychiatric findings often occur during acute exacerbations of the systemic lupus erythematosus and in the later stages of the disease. Nevertheless, it has been demonstrated in recent years that widespread and early involvement of the nervous system may take place in this disorder. In fact, cases have been reported illustrating the fact that evidence of nervous system dysfunction may be the first manifestation of systemic lupus erythematosus.[2]

The actual incidence of neurologic and psychiatric signs and symptoms in this disease is unknown. However, it is undoubtedly considerable. Three studies have noted the frequency of nervous system disease in systemic lupus erythematosus to be 18 per cent,[3] 28 per cent[4] and 37 per cent,[1] respectively. As neurologic and psychiatric difficulties in this disorder tend to become more frequent as the disease progresses, the discrepancy in figures among the various reports may be due, in part, to whether or not the institution furnishing the statistics provides terminal care to patients.

Convulsions

Convulsions are the most common sign of neurologic dysfunction found in systemic lupus erythematosus. Most reports have noted the frequency of seizures in lupus erythematosus to be about 15 per cent,[1,4,5] although figures as high as 35 per cent[6] have been mentioned. The convulsions are most frequently generalized but may be focal. The patient may suffer from only one fit during the course of his illness or status epilepticus may develop, controlled only by the vigorous use of anticonvulsant drugs and systemic amelioration of his illness by hormonal preparations. While convulsions may occur in the early stages of the illness, seizures are more apt to take place later in the disease.

Other Central Nervous System Findings

While not as frequent as convulsive seizures, such manifestations of cerebral dysfunction as monoplegia, hemiplegia, aphasia, vertigo, nystagmus and intention tremor, choreiform movements, cortical blindness, choked disks and decerebrate rigidity have been noted.[1,3,4] While certain states, such as hemiplegia, may be permanent, this is not necessarily the case. Dramatic or partial recovery may at times take place. As with convulsive seizures, these manifestations do not always occur in the later stages of the illness.

More infrequent are such spinal cord signs as paraplegia and quadriplegia.[4] Piper[7] has reported one case of systemic lupus erythematosus with paralysis of the lower extremities. Postmortem examination revealed vascular infarction of the spinal cord.

Peripheral Nerve Involvement

While neuritis is a common manifestation of periarteritis nodosa, it has been noted, in contrast, that the peripheral nerves are infrequently involved in systemic lupus erythematosus. Those cases of lupus erythematosus showing evidence of neuritis have presented no consistent pattern of involvement, and such clinical entities as neuronitis, mononeuritis and polyneuritis have been

---

Dr. Clark is from the Section of Neurology and Dr. Yoss is a Fellow in Neurology at the Mayo Clinic and Mayo Foundation.

noted. In view of the frequency with which neuritis is found in periarteritis nodosa, it is of interest to note that at postmortem examination two of three typical cases of systemic lupus erythematosus reported in the literature have shown vascular lesions suggestive of periarteritis nodosa.[8,9]

Case 1.—A twenty-year-old woman was admitted to the Mayo Clinic in 1945 and 1946 because of an erythema multiforme-like eruption on the palms and fingers of both hands and a past history of skin lesions on the face including the cheeks. On both occasions the sedimentation rate (Westergren) was elevated (69 mm. and 61 mm. in one hour). She was again seen in March, 1948, because of fever, malaise, lymphadenopathy and mild generalized weakness of approximately three weeks' duration. She had noted Raynaud's phenomenon during the previous three months. On the day prior to admission the patient had experienced an unwitnessed episode of loss of consciousness in which she bit her tongue and was confused for a short time after the spell.

On admission the patient was found to be acutely ill. Inspection revealed a moderate amount of involuntary and irregular jerking movements of the face and upper extremities. The blood pressure was 120 mm. of mercury systolic and 60 diastolic; pulse rate was 84; and temperature was 99.2° F. There was a diffuse blush to the skin of the face and a maculopapular dermatitis on the extensor surfaces of both forearms. There was a mild cervical and axillary lymphadenopathy. The results of neurologic examination were normal except for the choreiform movements of the upper extremities and face.

During her two-week stay in the hospital the patient had three episodes of loss of consciousness, at least one of which was a typical generalized seizure consisting of clonic movements of the entire body. Minor spells of "dizziness" associated with a "funny feeling," thickened speech, and momentary loss of consciousness occurred on several occasions. The choreiform movements continued but decreased in intensity during the hospital stay. Her oral temperature ranged from 99.0°- to 101.0° F. while in the hospital.

The concentration of hemoglobin was 10.6 gm. per 100 cc. of blood and that of the total proteins was 7.3 gm. per 100 cc. of serum, with an albumin-globulin ratio of 3.3:4. The sedimentation rate (Westergren) was 125 mm. in one hour; leukocyte counts ranged from 3,400 to 5,800 per cubic millimeter of blood. Reactions of Kahn, Kline, Hinton and Kolmer tests were all weakly positive. Urinalysis revealed albuminuria, granular casts, leukocytes and microhematuria. Sternal aspiration showed L.E. cells. Spinal fluid pressure was 140 mm. of spinal fluid with the patient in the horizontal position. The spinal fluid total protein was 65 mg. per 100 cc. There were 13 lymphocytes per cubic millimeter and the colloidal gold curve was 0143320000. An electro-encephalographic tracing disclosed a continuous, diffuse high-voltage dysrhythmia that was frequently interrupted by short paroxysms of 3-per-second atypical spike-and-wave discharges.

Comment on Case 1.—This case is presented as an example of convulsions and chorea occurring in systemic lupus erythematosus with evidence of abnormal changes in the electro-encephalogram and spinal fluid. There was increased spinal fluid protein with pleocytosis and a diffusely abnormal electro-encephalogram with atypical spike-and-wave activity.

Psychic Manifestations

One of the first clinical studies of lupus erythematosus noted that mental difficulties are associated with this disease.[10] More recently, a wide variety of psychic disturbances have been found in connection with the disorder. Four recent studies of groups of patients with systemic lupus erythematosus have noted 9 per cent,[3] 17 per cent, 19 per cent[1] and 29 per cent,[6] respectively, to be so affected at one time or another. Thus abnormal psychologic reactions rank with convulsive seizures as being among the most frequent nervous system findings.

Among the various psychiatric manifestations reported are: anxiety, personality changes, emotional lability, mental deterioration, depression, obsessive trends, paranoid reactions, hallucinations with fever and schizophrenia-like states.[4,11,12] As with the neurologic manifestations, such psychic disturbances may be permanent or transient. Those psychologic difficulties that may be transient, such as anxiety, may change from day to day, at times without appreciable change in the physical signs of lupus erythematosus.

Case 2.—A forty-six-year-old woman came to the Mayo Clinic in August, 1952, complaining of episodes of weakness of the arms and legs. In March, 1952, the patient had noted the onset of sudden paralysis of the right lower extremity followed by a slow, partial return of function. Again in May, 1952, sudden severe weakness of the left upper extremity developed. This showed rapid, though partial, return of function. However following the partial recovery from the weakness of the left upper extremity the patient noted a mild, progressive difficulty in the use of both upper extremities especially for finer movements. The patient's husband also had noted a marked change in the personality of the patient during the previous year, with depression severe anxiety, emotional lability, poor memory and insomnia. These symptoms became so severe that she was no longer able to manage her home. In addition to the foregoing complaints, the patient had noted yearly ttacks of polyarthritis since 1936. Raynaud's henomenon in both hands had occurred intermittently or one year. Double vision had been noted on many ccasions during the past one and a half years.

On examination the patient was found to be depressed, nxious and had a definite memory deficit. There was mild lysarthria, and the gait was ataxic. The blood pressure vas 185 mm. of mercury systolic and 95 diastolic; pulse ate was 80; and the temperature was 98° F. A systolic nurmur was heard over the precordium. A mild redess of the skin over the cheeks and forehead was noted. Iany slightly enlarged lymph nodes were felt, especially the axillary and inguinal regions. There was hypernsive retinopathy of the optic fundi. The deep muscle retch reflexes were increased throughout, being most ctive in the left arm. There was moderate residual eakness in the left upper extremity and moderate eakness in both lower extremities, more marked on the ight than on the left. A Babinski response on the right vas obtained and there was an equivocal plantar reponse on the left. There was a minimal intention remor of the left hand.

The concentration of hemoglobin was 10.2 gm. per 00 cc. of blood; leukocytes numbered 6,100 per cubic nillimeter of blood. The sedimentation rate (Westerren) was 112 mm. in one hour. Reactions to the line, Kahn, Hinton and Kolmer tests were all veakly positive. Urinalysis showed albuminuria, ranular casts and microhematuria. Numerous L.E. ells were found on sternal aspiration.

The patient began to receive cortisone therapy the ast of August, 1952, and was dismissed from the clinic o be treated by her family physician. She noted a lefinite improvement in general well-being, speech and o-ordination until September 9, 1952, when her husband eported by letter that the patient's "left arm suddenly ecame paralyzed again, her face was contorted on the eft side, she was unable to talk and had difficulty in wallowing."

Comment on Case 2.—This case illustrates the ntermittent and widespread nature of the inolvement of the nervous system in systemic lupus rythematosus. The psychiatric manifestations vere severe and incapacitating, and were characerized by depression, anxiety, emotional lability nd mental deterioration. The episodic neurologic omplications were also severe, involving at one ime or another all of the patient's extremities. n examination a mild quadriparesis was found. n addition, the patient complained of double viion and showed a mild intention tremor of the eft hand on examination. The last report conerning her told of a sudden return of the left ipper monoplegia with weakness of the left side of the face and marked difficulty with speech nd swallowing.

Hormonal Therapy

During recent years hormonal therapy in the form of cortisone and corticotropin has been used successfully in producing a temporary amelioration of the symptoms and signs in certain cases of systemic lupus erythematosus. In some cases hormonal therapy has seemed to influence favorably and even dramatically neurologic and psychiatric findings. However, the evaluation of the effects of these drugs on the nervous system manifestations of this disorder has been difficult.[13] As noted previously, many of the neurologic and psychiatric signs and symptoms may be transient, even in the absence of therapy.

In addition, it has been found that these hormonal preparations may lower the convulsive threshold and actually induce seizures. Likewise, it is now well established that cortisone and corticotropin may precipitate psychiatric disturbances.[14] Thus, when such signs as convulsions and psychiatric disturbances appear during cortisone or corticotropin therapy, one is faced with the problem of whether the nervous system manifestations are due to the systemic lupus erythematosus or to the hormonal therapy.

Neuropathology

Reports of neuropathologic studies of cases of systemic lupus erythematosus have noted a considerable variability and, at times, a paucity of findings. In a number of cases the disease appears to involve primarily the smaller blood vessels of the nervous system, giving a clue to the etiology of the widespread neurologic and psychiatric manifestations. However, as Glaser[15] has noted, there may be a lack of clinical and pathologic correlation.

Summary

Clinical evidence of transient or permanent and focal or widespread involvement of the nervous system may occur at any time during the course of systemic lupus erythematosus. While neurologic and psychiatric signs and symptoms may be among the first manifestations of lupus erythematosus, these nervous system findings are more likely to occur during acute exacerbations of the disease and in the later stages of the disorder.

References

1. Harvey, A. M.; Shulman, L. E.; Tumulty, P. A.: Conley, C. L., and Schoenrich, Edyth H.:

Systemic lupus erythematosus: review of the literature and clinical analysis of 138 cases. Medicine, 33:291-437 (Dec.) 1954.

2. Siekert, R. G., and Clark, E. C.: Neurologic signs and symptoms as early manifestations of systemic lupus erythematosus. Neurology, 5:84-88 (Feb.) 1955.
3. Jessar, R. A.; Lamont-Havers, R. W., and Regan, C.: Natural history of lupus erythematosus. Ann. Int. Med., 38:717-731 (Apr.) 1953.
4. Clark, E. C., and Bailey, A. A.: Neurological and psychiatric signs associated with systemic lupus erythematosus. J.A.M.A., 160:455-457 (Feb. 11) 1956.
5. Schearn, M. A., and Pirofsky, Bernard: Disseminated lupus erythematosus. A.M.A. Arch. Int. Med., 90:790-807 (Dec.) 1952.
6. Dubois, E. L.: The effect of the L.E. cell test on the clinical picture of systemic lupus erythematosus. Ann. Int. Med., 38:1265, 1953.
7. Piper, P. G.: Disseminated lupus erythematosus with involvement of the spinal cord. J.A.M.A., 153:215-217 (Sept. 19) 1953.
8. Bailey, A. A.; Sayre, G. P., and Clark, E. C.: Neuritis associated with systemic lupus erythematosus: a report of five cases with necropsy in two. A.M.A. Arch. Neurol. & Psychiat., 75:251-259 (Mar.) 1956.
9. Heptinstall, R. H., and Sowry, G. S. C.: Peripheral neuritis in systemic lupus erythematosus. Brit. M. J., 1:525-527 (Mar. 8) 1952.
10. Hebra, Ferdinand, and Kaposi, Moriz: Lupus erythematosus. In: On Diseases of the Skin, including the Exanthemata. (Translated and edited by Waren Tay.) Vol. 4, pp. 14-47. London: New Sydenham Society, 1875.
11. Hanrahan, G. E.: Three cases of disseminated lupus erythematosus with psychosis. Canad. M. A. J., 71:374-377 (Oct.) 1954.
12. McClary, A. R.; Meyer, Eugene, and Weitzman, E. L.: Observations on the role of the mechanism of depression in some patients with disseminated lupus erythematosus. Psychosom. Med., 17:311-321 (July-Aug.) 1955.
13. Glaser, G. H.: Neurologic manifestations in collagen diseases. Neurology, 5:751-766 (Nov.) 1955.
14. Rome, H. P., and Braceland, F. J.: The psychological response to ACTH, cortisone, hydrocortisone, and related steroid substances. Am. J. Psychiat., 108:641-650 (Mar.) 1952.
15. Glaser, G. H.: Lesions of the central nervous system in disseminated lupus erythematosus. A.M.A. Arch Neurol. & Psychiat., 67:745-753 (June) 1953.

THE PHYSICIAN AND THE MENTALLY RETARDED CHILD

(Continued from Page 512)

The child will not fit comfortably into the family where his parents only superficially, verbally, or intellectually accept him and inwardly feel embarrassed, uncomfortable, or even resentful of having him identified as a member of their family. Although this child is one of the family, his parents often find it difficult to avoid comparing him with the siblings in regard to development and achievement, and not to expect more of him than he is able and ready to produce at any given time. There is still much that medical science can offer the retarded child and his parents despite the "widely held idea that (mental) subnormality is not preventable and that, once it is diagnosed in an individual case, little or nothing can be done to improve the mental functioning of the patient. These beliefs are much too simple to be true and their persistence is an obstacle to progress."[2]

References

1. Kugelmass, Newton: The Management of Mental Deficiency in Children. New York: Grune & Stratton, 1954.
2. World Health Organization: Joint Expert Committee on the Mentally Subnormal Child. Technical Report Series, No. 75. Geneva, (Apr.) 1954.
3. Manual of the International Statistical Classification of Diseases, Injuries, and Causes of Death, Vol. I, p. 114. Geneva, 1948.
4. Pearson, Gerald H. J.: The psychopathology of mental defect. Nerv. Child, 2:9, 1942.
5. Mahler-Schoenberger, Margaret: Pseudoimbecility: A magic cap of invisibility. Psychoanalyt. Quart. 11:149, 1942.
6. Sontag, L. W., Baker, C. T., and Nelson, Virginia L.: Personality as a determinant of performance. Am. J. Orthopsychiat., 25:555, 1955.
7. Clarke, A. D. B., and Hermelin, B. E.: Adult imbeciles: their abilities and trainability. Lancet 269:337, 1955.

Therapy of Serous Cavity Effusion with Colloidal Radioactive Gold 198

EDWARD P. ENGELS, M.D.
E. C. PAULSON, M.D.
DONN G. MOSSER, M.D.
Minneapolis, Minnesota

THERAPY of serous cavity effusion is a commonly encountered problem in the management of patients with advanced malignant disease. The pleural and peritoneal cavities are most commonly involved, although one infrequently sees pericardial involvement. Carcinoma of the breast or ovary are the most frequent producers of such accumulations of fluid.

Usually, paracentesis or thoracentesis has relieved the patient when distention becomes uncomfortable, and certain patients have benefited from x-ray therapy to the area involved. Of recent years the use of colloidal radioactive gold^{198} for therapy of pleural effusion or ascites has met with a moderate degree of success in various centers, and we are reporting results of such therapy at the University of Minnesota Hospitals and St. Joseph's Hospital, St. Paul, Minnesota, since it was first used here in August, 1953.

The initial investigations on the properties of radioactive colloidal gold were made by Sheppard and Hahn[1] in 1947. Müller,[2] in Switzerland, suggested its use in body cavities as an effective form of treatment of recurrent effusion in 1949.

Radioactive gold^{198} is prepared in a nuclear reactor by the slow neutron capture of twenty-four carat gold foil. It has a half life of 2.7 days and a mean effective life of 3.9 days. Approximately 95 per cent of its radiation dose is delivered in eleven days.

In its decay process Au^{198} emits primarily a beta particle with energy of .97 MeV and a .411 MeV gamma ray. The beta component has a maximum penetration in water and tissue of 3.8 mm. Ninety per cent of the total effective radiation is delivered by the beta component.

The commercial preparation* as received is a deep red colloid. It initially has an activity of 20 to 40 millicuries per cubic centimeter, is insoluble, and chemically inert. The particle sizes range from .003 to .007 microns. Goldie and Hahn[6] demonstrated in 1950 that in mice inoculated intraperitoneally with free sarcoma-37 cells, Au^{198} has a distinct destructive effect on the neoplastic cells. Furthermore, they demonstrated that macrophages collected this material and maintained their structural and functional integrity, whereas lymphocytes and polymorphonuclear leukocytes were partially or totally destroyed by radiation.

Colloidal Au^{198} appears to flocculate readily when introduced into serous cavities but 20 per cent may remain in fluid collections one week after injection. Small but measurable amounts appear in the blood and urine. It stains the walls of cavities a bluish-purple color, and after an interval a reticular pattern appears on the serosal surface presumably due to collections of macrophages laden with this material within lymphatics. The metabolism and distribution of the colloid were studied by Andrews, Root and Knisley.[8] They found a fairly rapid drop of radioactivity in the ascitic fluid which they felt was in part due to dilution resulting from production of more fluid but principally due to removal of gold^{198} from the fluid. This removal with subsequent fixation on serosal surfaces is ascribed to phagocytosis by macrophages in the fluid and on the serosa and also to the tendency of colloids to adsorb on the surface.

Knisely and Andrews[7] in a study of the postmortem findings in twelve cases report fibrous thickening of the peritoneal and pleural surfaces after Au^{198} instillation as well as fibrin accumulations on the surfaces. This factor as well as endothelial damage of lymphatics and capillary blood vessels is held to account for the mechanism of action of Au^{198}.

The direct cytotoxic effect of Au^{198} on malig-

Dr. Engels is a Fellow of the American Cancer Society at the University of Minnesota. Dr. Paulson is Clinical Assistant Professor of Radiology, and Dr. Mosser is Assistant Professor of Radiology, University of Minnesota Medical School.

*Au^{198} Aurcoloid, Abbott.

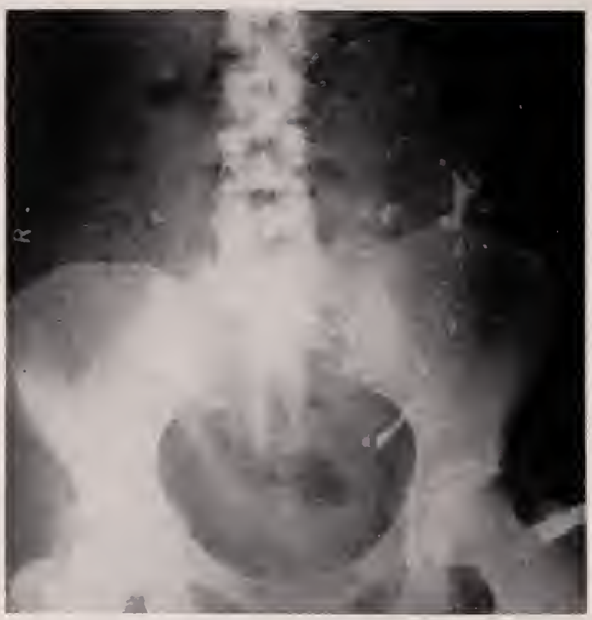


Fig. 1. Roentgenogram showing distribution of 1 cc. of lipiodol in the peritoneal cavity after its injection through the coiled polyethelene tube, followed by 20 to 30 cc. of saline and rotation of patient from side to side. This was done to rule out the chance of locculation of the radiogold.

nant cells implanted on pleural surfaces was demonstrated to us by the case of a fifty-nine-year-old woman who developed bilateral malignant pleural effusions secondary to breast carcinoma. Only one pleural cavity was treated with radiogold. She expired after twenty-five days. Autopsy showed disappearance of tumor seedlings with the substitution of fibrosis and thickening of pleural surface on the treated side. The untreated side showed typical neoplastic frosting of the pleura.

Selection of Cases

In general, the criteria for selection of cases may be itemized as follows:

1. Proven carcinomatous effusion.
2. Prognosis for several months' survival.
3. Presence of a freely communicating pleural or peritoneal space, i.e., absence of locculation or pockets.
4. Metastases of comparatively small size, i.e., under 8 to 10 mm. in diameter.

While the criteria are easily understood and evident, the practical use of radiogold is quite limited. It is particularly difficult to adhere to the second criterion. This is evidenced in our own material and also in the literature where often patients survive only a month or less after administration of Au^{198}.

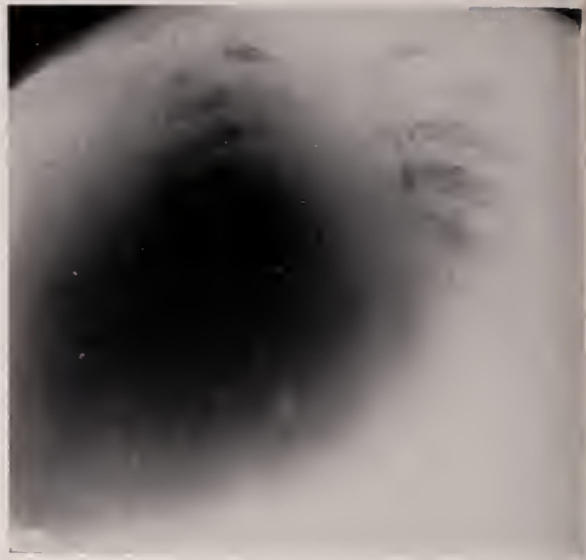


Fig. 2. Combination of chest roentgenogram and radioautograph. Film made twenty-four hours following instillation of 75 mc. of Au^{198} in right pleural space. The roentgenogram was deliberately underexposed to heighten the relative effect of the radioautograph.

Method of Administration

As mentioned above, the Au^{198} colloid is received as a deep red liquid, a few cubic centimeters in volume, in a sterile glass vial heavily shielded by lead. The dosage generally used is 75 millicuries in the pleural cavity and 100 to 125 millicuries in the abdomen. Since the potent gamma radiation of radiogold constitutes a definite radiation hazard, it is important to arrange the technique of administration to protect the operator. This is achieved by using an indirect method with saline infusion, rubber tubing, syringe and a two-way stopcock. Saline is drawn from an overhanging flask and forced by the syringe into the rubber capped vial of Au^{198} through an entrance needle, while an exit needle and tubing conduct the "hot" material to the thorax or abdomen. This permits the operator to remain at a distance of three or four feet from the radiation source.

The radiogold is injected immediately following a thoracentesis or paracentesis through the same needle used for these procedures. In the case of a "dry" tap which was the case in several patients with ovarian carcinoma and ascites, where fluid had not yet re-accumulated following surgery, there may be some apprehension about locculation and failure of free movement of the Au^{198} in the peritoneum. This question was clarified by one of us (E.C.P.) on several occasions by injecting 1 cc. of lipiodol through the polyethelene catheter into the abdomen followed by 20 to 30 cc. of saline. The patient was then rotated from side to side to allow circulation of this material throughout the peritoneal cavity. A roentgenogram was then made (Fig. 1). Since this showed satisfactory distribution of the contrast medium, the gold colloid was injected with confidence that it would follow a similar distribution pattern.

After the tubing is withdrawn, the patient is instructed to rotate through a routine series of positions at short intervals to secure spread of the radioactive material throughout the pleural or peritoneal space. The combination roentgenogram and radioautograph of the chest (Fig. 2) shows the type of radiation pattern obtained.

Regulations of the Atomic Energy Commission require that patients treated with radioisotopes be hospitalized until the radioactive material has "decayed" to thirty millicuries. In the case of Au^{198} with its 2.7 day half life, this means usually four or five days' hospitalization. Nursing care is not complicated in these patients since the radioactive material is largely retained in the body. Actually, the radiation hazard of tending these patients is less than in most radium cases.

Reactions to the procedure were mild, in our experience. Some patients mentioned slight nausea during the first two or three days following the treatment. In addition to this, a few patients had a delayed reaction about three weeks later consisting of nausea and vomiting. In two cases this required intravenous feedings for several days. Occasional diarrhea is also experienced. Since these patients are all suffering from a serious disease which produces its own symptoms, it is often difficult to decide which ones should be attributed to the radiogold treatment and which to the primary disease.

It is not uncommon to have fluid re-accumulate within two or three weeks of the treatment, necessitating an additional tap. This is not an indication of failure if subsequent taps are rendered less frequent or unnecessary.

Evaluation and Results

A total of thirty-one patients from the University of Minnesota Hospitals and St. Joseph's Hospital in St. Paul were treated for carcinomatous effusion. There were a total of thirty-three infusions in this group, two patients having both peritoneal and thoracic treatments. There were fourteen peritoneal and nineteen thoracic infusions. A successful result was interpreted to mean a decrease in the amount of effusion following the treatment for a period of at least a couple of months. Patients who expired within five weeks of the treatment were considered unsuitable for classification. In excluding such cases, we are following the pattern of other writers on the subject.[3,4,5,9] Of the fourteen peritoneal effusions treated, there were six successes, five failures, and three who could not be classified because of death within five weeks. In the group of nineteen pleural effusions, there were ten successes, six failures, and three who were unsuitable for consideration. The results are summarized in Table I.

TABLE I. RESULTS OF TREATMENT OF CARCINOMATOUS EFFUSIONS WITH COLLOIDAL AU^{198}

	Total	Success	Failure	Unsuitable (Death within five weeks)
Peritoneal Effusions	14	6	5	3
Pleural Effusions	19	10	6	3
Total	33	16	11	6

Our experience indicates about 50 per cent improvement in patients suffering from carcinomatous effusions. This coincides with the results reported from several other institutions.[3,4,5,9] It must be reiterated that this treatment aims only at palliation of the effusion and does not alter the general course of the disease. Such palliation can also be achieved by other agents, such as conventional external radiation, hormones, and nitrogen mustard.

References

1. Hahn, P. F.; Goodell, J. P. B.; Sheppard, C. W.; Cannon, R. O., and Francis, H. C.: Direct infiltration of radioactive isotopes as a means of delivering ionizing radiations to discrete tissues. J. Lab. & Clin. Med., 32:1442, 1947.
2. Müller, J. H.: Zur medicinish-therapeutischen Verwendung der künstlichen Radioktivität. Bull. Schweiz. Akad. Med. Wissensch., 5:484, 1949.
3. Andrews, G. A., et al: Intracavitary colloidal radiogold in the treatment of effusions caused by malignant neoplasms. Ann. Surg., 137:375, 1953.
4. Kligerman, M. M., and Habif, D. V.: The use of radioactive gold in the treatment of effusion due to carcinomatosis of pleura and peritoneum. Am. J. Roentgenol., 74:651, 1955.
5. Rose, R. G.; Osborne, M. P., and Stevens, W. B.: Intracavitary administration of radioactive colloidal gold. New England J. Med., 247:663, 1952.
6. Goldie, H., and Hahn, P. R.: Distribution and effect of colloidal radioactive gold in peritoneal

(Continued on Page 540)

Treatment of Cutaneous Scars by Dermabrasion

Preliminary Report

CARL W. LAYMON, M.D.
CHARLES J. BALOGH, M.D.
Minneapolis, Minnesota

IT is a well-known fact that acne may be followed by pitted scars which have a profound, deleterious effect upon the personality of some patients. Attempts to improve various disfigurements of the skin have been made for centuries. Kromayer (1905)[1] described his "Rotationsinstrumente" which consisted of cutaneous punches powered by dental motors and applied vertically to the skin to remove tatoos, pigmentations, scars and other lesions. Later he replaced the cylindrical knives with steel burrs and rasps. Although he used ethyl chloride as a local anesthetic, Kromayer felt that it was unnecessary since it prolonged the operations and pain was minimal. Many years later he (1929)[2] discussed the treatment of scars following variola, in which the skin between the pits was abraded down to their level, using novocaine as a local anesthetic.

Iverson (1947)[3] discussed sand paper as an abrasive in the treatment of traumatic tatoos of the face, utilizing general anesthesia. McEvitt (1948)[4] employed this method in the treatment of scars which followed acne vulgaris. The face was abraded by hand although motor-driven discs were used for the facial contours.

Kurtin (1953)[5] discussed motor-driven steel brushes as a method of planing the skin. Ethyl chloride was employed to harden and anesthetize the areas which were treated. Kurtin's observations stimulated much interest since the treatment could be done in the office.

Blau and Rein (1954)[6] wrote a comprehensive article on the subject of dermabrasion. They treated 400 patients and questioned other physicians who had experience with the procedure. It was the consensus, based upon a total of 2,306 cases, that dermabrasion was of definite value in the treatment of scars following acne vulgaris. Wire brushes, driven by a motor, were used by Blau and Rein. Sirot and Rein (1956)[7] concluded that planing was the treatment of choice for scars following acne. They believed that good results could be anticipated and were obtained in properly selected cases.

Eller (1954)[8] reported favorable cosmetic results in 200 cases which were treated by rotary steel-wire brushes with a velocity of 12,000 r.p.m. under refrigeration with ethyl chloride. He mentioned, however, that profuse bleeding tended to mask the field of operation, making it difficult to obtain a uniform depth of abrasion. He also stated that the rotary steel-wire brushes were unsatisfactory in the removal of tatoos because the pigment collected between the bristles of the brushes, making it possible to grind part of the pigment back into the tissues.

Eller (1955)[9] discussed the improvements in rotary abrasive techniques for removing scars following acne, and other cosmetic defects such as scars following furuncles, variola, and trauma plus the removal of tatoos, pigmentations, nevi, keratoses and rhinophyma. He mentioned steel-wire brushes, steel burrs, heatless stones and diamond and ruby fraises powered by high-speed rotary motors. He stated that the recent developments in apparatus and techniques, combined with the use of newer local anesthetics (Freon derivatives) made the method simple and safe. Eller mentioned that complete epithelialization, with no visible scar, usually takes place within fourteen days after the operation. At that time he preferred the method of Schreus[10] which was described at a Congress held in Heidelburg (1949). Excellent results were obtained with a high-speed rotary abrasive appartus which Schreus had designed, having a velocity of 30,000 r.p.m., and utilizing stone grinders of various sizes and a protective sleeve to prevent spattering of the ground tissues. Eller preferred heatless stones in the treatment of tatoos because they remained

---

From the Department of Dermatology, Minneapolis General Hospital, Carl W. Laymon, M.D., Director; and the Division of Dermatology, University of Minnesota, H. E. Michelson, M.D., Director.

clean during the operation and were easier to guide, permitting the operator to see the skin planed away layer by layer. He used the Schreus high-speed apparatus with heatless stones, steel burrs and diamond and ruby fraises in hundreds of cases with "most satisfactory results." In many of his cases he used procaine-Cobfrin local anesthesia and thought that it was not necessary to harden the skin by freezing. He believed that procaine anesthesia was advantageous because the field was always visible and not disguised as it was by freezing. In the average case of scars following acne, abrasion (utilizing the Schreus apparatus with stone grinders) produced a satisfactory result. In patients having more severe and deeper scars, a second and even a third dermabrasion was necessary at intervals of approximately six months.

The use of ethyl chloride as a refrigerant was hazardous because it was inflammable, explosive, irritating to the skin, and a potentially dangerous anesthetic by inhalation. An expensive noisy blower was required when ethyl chloride was employed. The Freon derivatives, Freon mixture (Freon 114 with another derivative added) and Freon 114 (dichlorotetrafluoroethane), are noncombustible, nonexplosive, nontoxic, nonirritating, have very little odor, and no general anesthetic properties. Freon is sprayed on the skin in the same manner as ethyl chloride and no blower is required. Since Freon has been used as a local anesthetic, Eller [11] prefers serrated steel wheels driven by a dental motor (12,000 r.p.m.) to any of the other instruments. The planing method, while employing the same basic principle of abrasion by sand paper, constitutes an improvement since it eliminates the risk of the development of silica-granuloma.

Technique of Dermabrasion

It is important that the patient has a clear concept of dermabrasion. Following inquiry concerning the procedure, he is given a short, descriptive outline; and subsequently any questions are answered which may arise. Preoperative pictures are taken of all patients so that the scars can be clearly recorded for future comparison with the postoperative appearance of the skin. Demerol (50 to 100 mg.) may be used as a preoperative sedative although it is not absolutely necessary.

Prior to the abrasion, the face is thoroughly cleansed and ice packs are applied for a period of 20 to 30 minutes. They consist of plastic bags containing a 5 per cent solution of propylene glycol and are applied to the face in order to minimize the shock of freezing with Freon. The scalp and the ears are covered with a towel and vaseline is applied to the eyelids and lips. Pledgets of cotton may be placed in the nostrils.

The area which is to be treated is outlined by gauze squares and frozen with a spray of Freon. The gauze is removed and the area is treated. The serrated steel wheel revolves clockwise and the handle is moved in short strokes up and down or with a circular motion until the entire area has been abraded to the proper depth. Hubler[12] suggested the use of a 1 per cent solution of gentian violet for purposes of delineation. We have found that this is unnecessary. After the initial area has been treated, other involved areas are similarly frozen and abraded.

Following dermabrasion, dry gauze squares are used to control oozing from the skin which has been treated. When the latter are removed, Telfa (Bauer & Black), nonadherent, sterile strips are applied as suggested by LeVan[13]. These dressings are most advantageous because they are nonadherent. Following the application of Telfa dressings, gauze squares are applied and a 5-inch stockinette is drawn over the head to hold the dressing in place. For the eyes and mouth holes are cut in the stockinette, which is knotted under the chin and on the crown to prevent slipping.

The patients are advised to sleep on two or three pillows during the first night in an attempt to minimize edema. We use no topical application of antibiotic ointments and instruct our patients to return daily for dressings. Others, however, do not examine their patients until four weeks following the procedure.

Comment

As a rule, dermabrasion produces only moderate discomfort, although some patients experience a burning sensation. Occasionally there is alarm when the bandages are removed because the erythematous, edematous skin is covered with dry, bloody crusts. The latter fall within a period of seven to ten days. After the second week, patients usually return to their normal activities, although some individuals prefer to remain home a few more days because of the erythema. In most cases the edges of the scars began to recede by the fourth week and the maximum improvement occurs within six months.

The results from treatment depend upon the depth and shape of the scars. Superficial, flat ones respond better than the deep, pitted, "icepick" scars or wide, flat, confluent ones which produce an undulating appearance of the skin. Unfortunately, the latter occur frequently and produce the most severe cosmetic defects. The results are rarely dramatic, although the majority of patients are pleased with the improvement in their appearance. The treatment may be repeated four to six months later if indicated. The presence of a few acne lesions does not interfere with dermabrasion.

Complications are occasionally observed. Impetigo may develop soon after the procedure. More often milia appear several weeks later. Rarely, post-operative erythema persists for several months instead of for the usual three or four weeks. This may be due to premature or excessive exposure to sunlight or to vigorous cleansing. In some cases hyperpigmentation at the edges of the abraded areas, or mottling persists for a while. The appearance of eczematous patches has been noted; and, rarely, keloids have developed.

The procedure to flatten scars is a cosmetic one, hence patients should be carefully selected. A perfect result should not be expected, although most observers agree that dermabrasion is the best treatment for the improvement of scars following acne vulgaris. Superficial, flat scars usually respond best to treatment, although other types are benefited in various degrees. We have obtained gratifying results, using serrated steel wheels in the abrasion treatment of scars following acne vulgaris of the face, rhinophyma, multiple seborrheic keratoses of the trunk, multiple superficial epitheliomas, and tatoos. Epidermal regeneration occurs more readily and completely on the face than other parts of the body because of the large number of philosebaceous follicles and sweat glands.

References

1. Kromayer, E.: Rotationsinstrumente, ein neues technisches Verfahren in der dermatologischen Kleinchirugie. Dermat. Ztchr., 12:26, 1905.
2. Kromayer, E.: Cosmetic treatment of skin complaints (English translation of the 2d German [1929] edition). New York, Oxford University Press, 1930, p. 9.
3. Iverson, P. C.: Surgical removal of traumatic tatoos. Plast. & Reconstruc. Surg., 2:427, 1947.
4. McEvitt, W. G.: Acne pits. J. Michigan M. Soc., 47:1243, 1948.
5. Kurtin, A.: Corrective surgical planing of skin. Arch. Dermat. & Syph., 68:389, 1953.
6. Blau, S., and Rein, C.: Dermabrasion of the acne pit. Arch. Dermat. & Syph., 70:754, 1954.
7. Sirot, G., and Rein, C.: Current status of dermabrasion therapy. Connecticut State M.J., 20:1, 1956.
8. Eller, J.: Removal of pitted acne scars and other skin defects by surgical planing. New York State J. Med., 54:1166, 1954.
9. Eller, J.: Acne and acne scars, developments in rotary abrasive technics for removing acne scars and other cosmetic defects. New England J. Med., 253:11, 1955.
10. Schreus, H. T.: Hochtouriges Schleifen der Haut. Arch. f. Dermat. u. Syph., 191:678, 1950.
11. Eller, J.: Freon, a new and safe refrigerant anesthetic for surgical skin planing. New York State J. Med., 55:2352, 1955.
12. Hubler, M. R.: Comments on the techniques of acne planing. Arch. Dermat. & Syph., 70:513, 1953.
13. LeVan, P.: Mechanical method of freezing the skin for surgical planing. Arch. Dermat. & Syph., 69:739, 1954.

SIGMOIDO-PERINEAL FISTULA

(Continued from Page 516)

5. Guy, C. C., and Werelius, C. Y.: Complications of diverticulitis of the colon. S. Clin. North America, 32:91-109 (Feb.) 1952.
6. Cave, H. W., and Alsop, W. E.: Diverticulitis of the colon. S. Clin. North America, 26:390-396 (April) 1946.
7. Bacon, H. E., and McKay, E. R.: Surgical management of diverticulitis of the sigmoid. J. Internat. Coll. Surg., 11:560-569 (Nov.-Dec.) 1948.
8. Swinton, N. W.: Surgical aspects of diverticulitis. Am. J. Surg., 82:603-610 (Nov.) 1951.
9. Moore, R. M., and Kirksey, O. T.: One-stage resection in selected cases of diverticulitis. Ann. Surgery, 139:826-832 (June) 1954.
10. Donald, J. M.: Surgical management of diverticulitis of the colon. Ann. Surg., 133:708-718 (May) 1951.
11. Hill, J. R.: Infections and sinuses other than fistulas in the perianal region. Am. J. Surg., 88:829-834 (Nov.) 1954.
12. Scarborough, R. A.: Discussion of paper by J. R. Hill. Am. J. Surgery, 88:824-828 (Nov.) 1954.
13. Johns, W. A.: Diverticulitis of the colon—the prevention of complications. Tr. South Surg. A., 63:307-315. 1951.
14. Welch, Claude E., Allen, A. W., and Donaldson, G. A.: An appraisal of resection of the colon for diverticulitis of the sigmoid. Ann. Surg., 138:332-343 (Sept.) 1953.

Now Available

7 Years Sickness Benefits

(HOUSE CONFINEMENT NOT REQUIRED)

Lifetime Accident Benefits

This extension of benefits is now available to you as a member of the Minnesota State Medical Association. Since December, *1947,* the inception date of our plan for members of your Association, the Caswell-Ross Agency has attempted at all times to secure for you the finest coverage in the accident and sickness field. These improvements will make your policy the best among many available to you. An application has been sent to you previously—why not complete and return it to our office now.

CASWELL-ROSS AGENCY

1177 N. W. Bank Building Minneapolis 2, Minnesota
Minneapolis—FE 2-2585 St. Paul—MI. 5-7004

Administrators of Professional Disability Plans

Minnesota State Bar Association
Minnesota State Dental Association
Minnesota Society of C. P. A.
Minnesota State Pharmaceutical Assn.
Minnesota Auto Dealers Association
Minnesota Federation of Eng. Societies
Minnesota State Veterinary Medical Soc.
Hennepin County Medical Society
Hennepin County Bar Association
11th Judicial Bar Association
Minneapolis Association of Life Underwriters
Minnesota State Life Underwriters Assn., Inc.
Ramsey County Medical Society
Ramsey County Bar Association
St. Paul District Dental Soc.
Minneapolis District Dental Soc.
St. Cloud Dental and Stearns County Medical Society
Duluth District Dental Society
East Central Medical Society
St. Louis County Medical Society
West Central Dist. Dental Society
Northwest Proprietors Association
St. Paul Life Underwriters, Inc.

ACHROMYCIN*

Tetracycline *Lederle*

ACHROMYCIN is unsurpassed in its range of effectiveness. Each successive month more physicians are confirming this fact for themselves in their own daily practice in the therapy of respiratory, genitourinary, dermatologic and other infections.

ACHROMYCIN can be of service to you because of these important advantages:

- true broad-spectrum action
- rapid diffusion and penetration
- prompt control of infection
- proved effective against a wide variety of infections caused by Gram-positive and Gram-negative bacteria, rickettsiae, and certain viruses and protozoa
- side effects, if any, usually minimal
- produced under exacting quality control in Lederle's *own* laboratories and offered *only* under the Lederle label
- a *complete line* of dosage forms

ACHROMYCIN SF

ACHROMYCIN Tetracycline with STRESS FORMULA VITAMINS for severe or prolonged illness. Attacks the infection—defends the patient — hastens normal recovery. Offered in Capsules of 250 mg. and in an Oral Suspension, 125 mg. per 5 cc. teaspoonful.

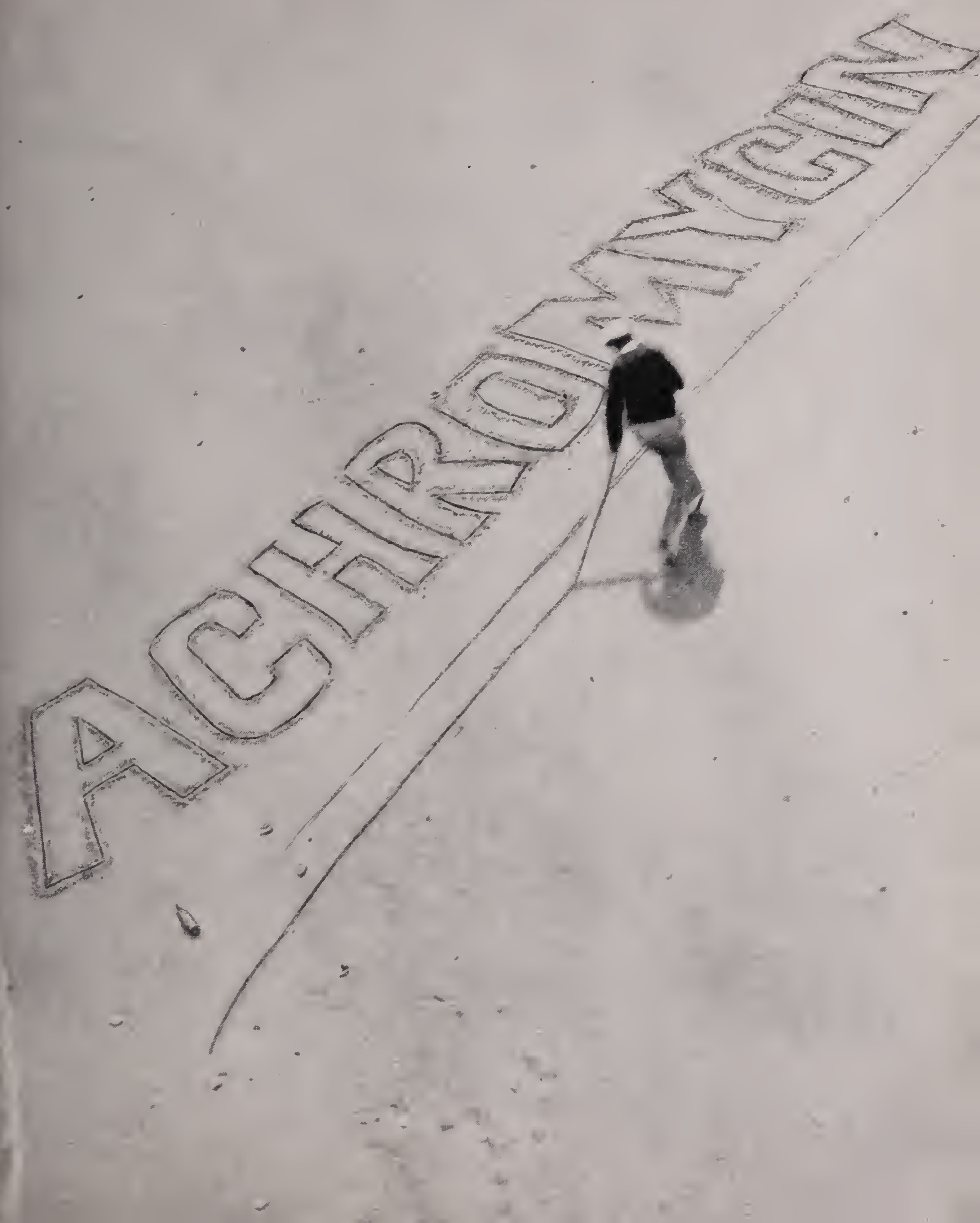
dry-filled sealed capsules

LEDERLE LABORATORIES DIVISION
AMERICAN CYANAMID COMPANY
PEARL RIVER, NEW YORK

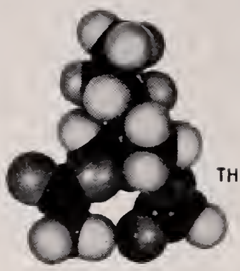
Lederle

*REG. U. S. PAT. OFF.

PHOTO DATA: 8 X 10 GROVER VIEW CAMERA
100 SEC. AT F.22 EXISTING LIGHT



ACHROMYCIN



THE MILTOWN MOLECULE

A tranquilizer well suited for prolonged therapy

NO ORGANIC CONTRAINDICATIONS

reported to date

- well tolerated, non-addictive, essentially non-toxic
- no blood dyscrasias, liver toxicity, Parkinson-like syndrome or nasal stuffiness
- chemically unrelated to chlorpromazine or reserpine
- does not produce significant depression
- orally effective within 30 minutes for a period of 6 hours

Indications: anxiety and tension states, muscle spasm.

Miltown®

THE ORIGINAL MEPROBAMATE

DISCOVERED AND INTRODUCED by Wallace Laboratories, New Brunswick, N. J.

2-methyl-2-n-propyl-1,3-propanediol dicarbamate—U. S. Patent 2,724,720

SUPPLIED: 400 mg. scored tablets. Usual dose: 1 or 2 tablets t.i.d.

Literature and Samples Available on Request

Chronic Lower Lip Lesions

Treatment by the "Lip-shave" Operation

JOHN K. GROTTING, M.D.
Minneapolis, Minnesota

THE vermilion margin of the lower lip is subject to many types of lesions, acute or chronic, benign or malignant. The majority of lesions of the lip heal with conservative treatment, using bland ointments and by protecting the lip from the elements. A few, however, remain chronic and resistant to all types of conservative treatment. It is this group that requires a more vigorous approach to the problem, for many, unless treated surgically, will fail to heal and go on to more serious degeneration.

Most surgeons who have used the "lip-shave" operation in the treatment of this type of lip problem are generally satisfied with the results attained and, invariably, wonder why this procedure does not enjoy more general usage.

The vermilion margin of the lower lip, or red area, is a very interesting area. It represents the junction of the skin epithelium with the epithelium of the oral cavity. It is made up of mucous membrane somewhat similar to that which lines the oral cavity although its germinal layer is not quite so well developed. In the oral cavity, however, the mucous membrane enjoys a moist environment. On the vermilion margin, except when wetted by the tongue, it is in a dry type of environment similar to that in which the skin exists. The vermilion margin normally in man is not cornified. The epithelium is considerably thickened in the infant to enhance the function of sucking, but this thickening disappears later.

The presence of cornification, then, is abnormal and apparently develops as a degenerative process on the lip secondary to irritating processes to which it is susceptible. When cornification appears on the lip, it is usually white and in the form of leukoplakia. This cornification of leukoplakia differs slightly from the normal skin cornification in that it usually has what the dermatologists refer to as "parakeratosis," or persistence of the nuclei of the germinal layers in distorted forms out to the outermost layers of cells.

Certain people are more prone to develop cornification and other chronic lesions of the lip, particularly farmers and other patients who are exposed to wind and sun. Red-haired, fair-skinned individuals also seem more prone to develop these lesions. The factor of pipe-smoking may be debatable, although it is often accused of being an etiological agent. Cracking of the lower lip with the development of chronic fissures and nonspecific inflammation may lead to the habit of stroking the crack with the teeth or tongue, further irritating it, and with further irritation there is more tendency to irritate it; and a vicious cycle develops. It may be impossible to break this cycle until the fissure is removed.

There are also other nonspecific types of degeneration of the lower lip which, if they do not heal, can be treated by using the "lip-shave" operation. Carcinoma *in situ* and low-grade carcinomas which are very superficial may also be treated by this method. No one can say that a given area of leukoplakia is going to break down and become malignant, but when malignancy of the lip is seen, it is not uncommon to find it preceded by or associated with leukoplakia. About one-fourth of them are associated with leukoplakia in some reported series. It, therefore, seems wise to treat this condition, which we label as "pre-malignant," before the serious changes occur.

Most carcinomas of the lower lip develop in the portion of the vermilion border which lies anterior to the line of contact between the upper and lower lips. Also, they usually occur at a point approximately midway between the midline and the buccal commissure. Degenerations in these areas, then, should cause one to become even more alert to potential malignancy and suggest treatment with as little delay as possible.

The skin surface of the lower lip has sebaceous glands and hair follicles. On the vermilion portion of the lip these are absent. The submucosa in this area contains thinner collagenous and elastic fibers than are under the skin and has a somewhat looser arrangement of these fibers. There is a liberal vas-

---

Presented before the Minneapolis Surgical Society, January 6, 1955.

cular supply and a labial artery fairly close to the upper border. Along the posterior surface there are small clumps of mucous glands in the submucosa. The central portion is made up of muscle fibers.

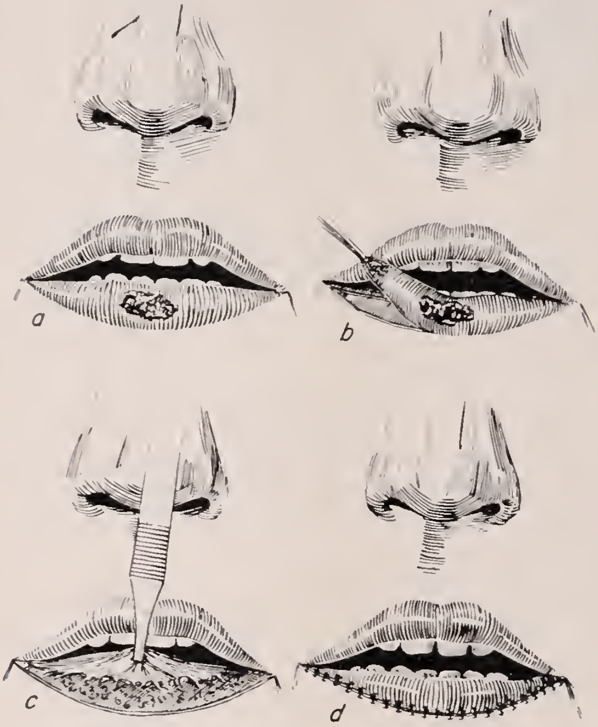


Fig. 1.

The term "lip-shave" may not be as scientifically accurate as one would like, but it is descriptive and does enjoy a rather general usage.

The first step in the operation is to mark with a dye or marking pencil an outline of the area which is to be resected. The anterior mark is placed along the junction of the skin with the mucous membrane, and the posterior mark is outlined so as to include the involved areas and may be as wide as 1.5 centimeters at its mid-portion. Following this, the lip is injected with 1 per cent procaine supplemented with adrenalin for hemostasis and longer duration of anesthesia. Incisions are then carefully made along the lines which have been outlined, removing as deeply as is necessary (Fig. 1b). Following this, the mucous membrane inside the lip is carefully undermined enough so that it can be drawn out to meet the skin margin without much tension (Fig. 1c).

The skin surface is not undermined because this would allow the hair-bearing skin to be pulled upward and posteriorly, and later the beard would grow and irritate the upper lip. All exposed mucous glands are carefully removed in order that they may not form mucous cysts later on due to interference with their ducts. After careful hemostasis is established, the internal mucous membrane is brought forward and sutured to the skin margin, using 000 or 0000 interrupted silk sutures (Fig. 1d). The lip may then be coated with petrolatum and left exposed to the air, and petrolatum applications as necessary during the healing period will keep the mucous membrane of the lip from drying out and scaling uncomfortably. The sutures are removed on the fourth and fifth postoperative days.

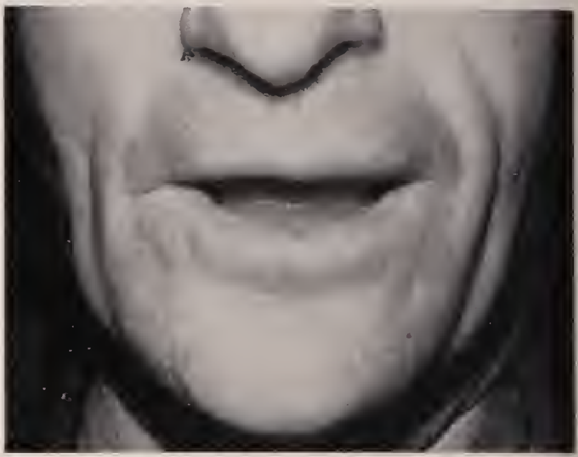


Fig. 2.

The usual healing of this operation leaves a scar along the mucocutaneous junction which becomes quite inconspicuous after a few months. The final photograph (Fig. 2) shows a representative postoperative result following a "lip-shave" operation.

The patient will have some sensitivity to cold weather for the first year, and he may complain that the lip does not feel quite natural for the first six months; but this, too, becomes less evident with time. A little reassurance will allay the patient's concern.

In conclusion, the "lip-shave" operation is a good procedure for the treatment of chronic lip problems that do not yield to more conservative management, and as it becomes more generally known, it may enjoy more usage.

Reference

1. New, G. B., and Figi, F. A.: Repair of postoperative defects involving the lips and cheeks secondar to the removal of malignant tumors. Surg., Gynec & Obst., 62:182-190 (Feb.) 1936.

Children and Farm Accidents

GEORGE B. LOGAN, M.D.
ARTHUR C. SMID, M.D.
Rochester, Minnesota

A FARM is a hazardous place on which to live. To the ordinary risks of home life is added the opportunity for close contact with such things as animals, machinery, tractors, ponds, streams, sharp implements, barbed wire and open and unprotected hay chutes. These hazards are as real for children as they are for adults.

A recent study[1] we made of childhood accidents in Rochester and Olmsted County disclosed that one third of the children brought to the hospital emergency room because of accidents were injured in rural areas and that such children were, in general, hurt more seriously than were those whose accidents were sustained in town. This study included 429 rural children who were brought to the emergency room because of accidents; 188 of them were injured to such a severe degree that they were admitted to the hospital.

The injuries sustained by these 429 children are summarized in Table I. The principal causes of the accidents are listed in Table II. The most frequent cause was unsupervised activity (19 per cent), although accidents in and around the house (15 per cent), those caused by foreign bodies (16 per cent) and those caused by motor vehicles (14 per cent) also were important numerically. Boys sustained nearly twice as many accidents as did girls. More than half of the accidents (261) involved children between the ages of two and ten years, and more than a third of the total (155) involved children between the ages of two and five. Children in this latter age group have been found to be particularly susceptible to accidents, whether they live on a farm or in town.[2]

Few children in this group were injured fatally. Many children, however, were hospitalized for weeks and were disabled for even longer periods. The average stay in the hospital was fourteen days, and the average duration of disability was sixty days. Certain types of accidents caused greater disability than did others; children who were burned averaged 127 days of disability, whereas those who had accidents with machinery were disabled for eighty-five days and those who had accidents caused by motor vehicles were disabled for eighty-one days.

One farm practice that leads to accidents is taking a child on the tractor as a passenger. This is sometimes done when the tractor is being used to pull a plow, cultivator or manure spreader in the field. Under such circumstances, the child passenger often has fallen off and been seriously injured. The following cases are examples of such injuries:

> A nine-year-old boy was riding on a tractor with his uncle. The tractor overturned and pinned the patient beneath it. He sustained a laceration of the skin and first-degree and second-degree burns of the left arm and thorax.
>
> A ten-year-old boy fell off a manure spreader. He suffered a depressed skull fracture that necessitated later repair by means of a tantalum plate.
>
> A four-year-old boy fell from a wagon on which he was riding behind a corn picker and his head was run over by the front wheel of the wagon. He suffered cerebral concussion and for a time had a left lateral oculomotor palsy. He was extremely fortunate not to have sustained more serious injury.
>
> An eleven-year-old boy was riding on a tractor that turned over and fell on him. He sustained a fractured rib and a fractured pelvis.

Boys of ten to twelve years of age often are allowed or compelled to drive tractors without aid. Such practice is defended on the ground of economic necessity. Children of this age are not permitted to drive cars; neither should they be permitted to drive tractors. Several years ago we had as a patient an eleven-year-old boy who had epilepsy and yet was compelled to do tractor plowing by his father. An instance of a boy

---

Dr. Logan is from the Section of Pediatrics, and Dr. Smid is a Fellow in Pediatrics, Mayo Foundation and Mayo Clinic.

The Mayo Foundation, Rochester, Minnesota, is a part of the Graduate School of the University of Minnesota.

TABLE I. TYPES OF INJURIES IN 429 RURAL CHILDREN

Injury	Patients	Per cent	Boys	Girls
Lacerations	141	28.8	94	47
Fractures and dislocations	109	22.3	70	39
Contusions	63	12.9	36	27
Head injury	46	9.4	31	15
Abrasions	35	7.2	21	14
Poisoning	30	6.1	18	12
Burns	22	4.5	13	9
Aspiration or ingestion	25	5.1	17	8
Sprains	4	0.9	3	1
Crush injury	11	2.2	10	1
Gunshot	2	0.4	1	1
Suffocation	1	0.2	1	..
Total	489*	100.0	315	174

*Some children had more than one type of injury in a single accident.

being allowed to run a tractor prematurely follows:

A ten-year-old boy was driving a tractor and in doing so tipped it over. He sustained a fracture dislocation of the third and fourth cervical vertebrae and was disabled for many months.

Threshing operations may result in serious accidents. One of the fatal accidents in 1954 was caused in this way.

A twelve-year-old boy was working with a threshing crew at his farm home. A wagon tongue in some way struck the boy in the thorax. He was dead on arrival at the hospital. Necropsy was not ordered by the coroner at the insistence of the family, so the exact cause of death could not be determined.

Barns with open hay chutes are dangerous places in which to play, as are silos and grain elevators.

A six-year-old boy was chasing pigeons on a silo. He fell off, sustaining fractures of the distal third of both forearms, a contusion of the head and a cut lip.

A seven-year-old boy fell 15 feet from a grain elevator. He sustained a skull fracture in the left parietal region but gave no apparent evidence of intracranial injury.

A twelve-year-old boy slipped or fell 8 feet to a cement floor while playing in a hayloft. He sustained a concussion and had bleeding from one ear. Evidence of a skull fracture or an intracranial lesion was not found.

A thirteen-year-old girl fell 20 feet down a hay chute. She landed on her right side on the concrete floor, sustaining a fracture of the third lumbar vertebra.

Pitchforks are necessary implements on a farm, but they can cause injury when not properly used.

TABLE II. PRINCIPAL CAUSES OF RURAL ACCIDENTS

- Unsupervised outdoor activities
  - Falls
  - Miscellaneous
- Unsupervised indoor activities
  - Falls*
  - Miscellaneous
- Foreign bodies
  - Penetrating
  - Aspiration or ingestion
  - Self-introduced
- Motor vehicle†
- Supervised activities
  - Falls
  - Miscellaneous
- Poisoning
- Machinery
- Burns
- Firearms
- Suffocation
- Miscellaneous
  - Doors and windows
  - Animals
  - Foreign objects

*Includes falls from porch.
†Includes all types whether a pedestrian or passenger. Excludes doors and windows.

A nine-year-old girl was walking backward in the farmyard while leading a horse. She stepped on the tine of a rusty pitchfork that was lying on the ground. The wound was cleaned and tetanus toxoid and penicillin were administered. Complications of the accident did not develop.

A three-year-old boy was struck in the right eye by the tine of a pitchfork. He sustained a laceration of the lid and of the cornea. Fortunately, he did not lose the sight of the eye nor did sympathetic ophthalmia develop.

"Flying" foreign bodies may be a farm hazard when machinery is being repaired.

A seven-year-old boy was standing near a tractor that was being repaired. A piece of steel was knocked loose and struck the patient in the right eye, causing a severe penetrating lesion. Although the foreign body was removed successfully, severe panophthalmitis developed and the right eye had to be enucleated.

The ingestion or aspiration of such foreign bodies as coins, buttons, pins, peanuts and vegetable matter is encountered among farm children as well as among city children. Accidents involving certain foreign bodies peculiar to farm living are illustrated in the following two cases:

A two-year-old boy was helping his mother feed chickens. He apparently put some of the corn feed in his mouth. He suddenly began to cough and gag and then became severely dyspneic. A whole kernel of corn was removed from the trachea. It had obstructed the airway almost completely and was delivered with some difficulty through the vocal cords. Recovery was uncomplicated.

A four-year-old boy was playing with a cowbell. He disengaged the lead clapper and swallowed it. Because of the resulting dysphagia, he was brought to the hospital. Roentgenologic study disclosed the foreign body to be in the esophagus at the level of the second thoracic vertebra. As preparations were being made to remove it by endoscopic means, the boy expelled it spontaneously. He made a prompt recovery.

Poisons constitute a menace to children not only from toxic symptoms but also in some instances from their corrosive action. Farm children appear to have more ready access to lye, hydrochloric acid and fuel oil than do children living in town, except those from low-income families.[3] It is essential that any potentially poisonous substance and all medicines be kept in a locked closet. Simply putting these things out of ordinary reach is not enough, for many small children are expert climbers. Ant and rodent poisons should be used only where and when children cannot get into the material after it has been spread out.

A two-year-old girl was found eating an ant paste containing 2.3 per cent sodium arsenate that her mother had spread on a paper and then placed on the floor. She was treated with BAL and made a good recovery.

A one-and-one-half-year-old girl found some concentrated hydrochloric acid used on the farm in soldering. She sustained not only severe burns of the esophagus but sufficient burns of the throat, causing edema of the pharynx, that the airway was occluded, necessitating tracheotomy. Subsequently, a program of esophageal dilation was required.

A child having a burn of any degree of severity poses a serious acute emergency problem. Burned children usually require long periods of hospital care, frequently need plastic correctional surgery and may be permanently disabled or disfigured. It is well recognized that playing with matches and starting fires with gasoline or similar fuel are to be avoided by children, yet burns from such activities still occur.

A five-year-old girl was playing with matches together with a friend. Her blouse caught fire and she sustained burns of first, second and third degrees on the right side of the thorax and face and the right arm. She was hospitalized for thirty days. Skin grafting was necessary and roentgen therapy for keloid formation ultimately had to be carried out. She still had some disability sixteen months after injury.

A four-year-old boy was playing on top of a strawstack when his older brother set fire to the stack. The child became frightened and would not come down. He finally rolled down through the flames, sustaining second-degree burns of the left buttock and knee and a first-degree burn of the left thigh. He was hospitalized for eight days and released from medical care in thirty days.

A twelve-year-old boy was using gasoline to light a fire in a stove. An explosion resulted in which the patient sustained facial burns of first, second and third degrees. Skin grafting was ultimately necessary. He was under medical care for two and one-half months.

Comment

Tractors and field machinery, barns, pitchforks, repair work, animal feeds, caustic and poisonous substances and fire are important etiologic factors in farm accidents among children. Ponds, watering tanks and streams may be sites of drowning accidents.[4] Only by knowing the causes and potential causes can those who are interested in safety continue to improve an accident-prevention program among rural citizens. It was encouraging in this regard to note the emphasis on farm safety in the 4-H Club exhibits at the Olmsted County Fair this past year.

This interest in farm safety has been the result of the work of Mr. Glenn Prickett, of the Extension Division of the School of Agriculture of the University of Minnesota. His work throughout the state with 4-H clubs, Future Farmers and other farm groups is to be highly commended.

"Safety vaccine" is the name given to the program of safety education.[5] So far, no one has found a better prophylactic program for accidents. Its importance has been stressed by including it in the table of immunization published jointly by the Minnesota State Medical Association and the State Board of Health. Those physicians whose practice is among the fine rural people in Minnesota have a definite responsibility for the proper administration of such "safety vaccine" to these people.

References

1. Smid, A. C., and Logan, G. B.: Accidents of children: A study of accidents of injured children seen at the Mayo Clinic in 1954. Minnesota Med., 39:392-399, 1956.
2. Dietrich, H. F.: The role of education in accident prevention. Pediatrics, 17:297-302 (Feb.) 1956.
3. Mellins, R. B.; Christian, J. R., and Bundesen, H. N.: The natural history of poisoning in childhood. Pediatrics, 17:314-326 (Mar.) 1956.
4. Rosenfield, A. B.; Allen, William, and Storey, E. W.: Home, safe home. Minnesota Med., 37:789-795 (Nov.) 1954.
5. Committee on Accident Prevention of the American Academy of Pediatrics: Are You Using the New "Safety Vaccine"? Pamphlet, 14 pp.

Activities of the Sears, Roebuck Foundation

J. ARNOLD BARGEN, M.D.
Rochester, Minnesota

THE Sears, Roebuck Foundation was organized in 1923 and reorganized in its present form in 1941 as a nonprofit venture to develop and assist projects all over the country which lead to improved communities and improved economic and professional opportunities. These projects are varied, yet most of them represent an investment in individual incentive and an investment in the ability and willingness of the American citizen to improve his standard of living and to better his way of life, if given opportunity and encouragement.

The Foundation is guided by four simple axioms:

1. Help does the most good where it is most needed.
2. The people whom it is easiest to help are those who have a sincere desire to help themselves.
3. Help makes the most sense where a small outlay is likely to bring the largest improvement.
4. Money is most advantageously spent on projects which can run themselves, once they have been started with adequate support.

Previous Endeavors

In the years since the establishment of the foundation, 15,000 youngsters have been assisted through college; many 4-H Clubs have been helped by the giving of prizes to members, and slum clearance has been carried on to a wide extent.

A program for the employment of the physically handicapped has been given wide recognition. Three questions might come to mind: (1) Why employ the handicapped? (2) What has been industry's experience with the handicapped? (3) What has been the policy as to employment of the handicapped? Space does not permit extensive consideration of these questions, but it can be said that they have been largely answered by the magnificent effort of the Sears, Roebuck Foundation.

There are in the United States more than 2,000,000 handicapped persons who are not in the labor market today but who are employable or would be employable, with the proper training. Each year this number is increased by more than 250,000 as the result of accidents, illness and injuries. Unless these people can be productively employed, so that they can support themselves and their families, their care will impose a great tax burden upon all of us, and lower the nation's productivity and purchasing power. Attention to this problem has been a very important activity of the Sears, Roebuck Foundation.

Merit Scholarships

More recently, the Sears, Roebuck Foundation has instituted a group of merit scholarships. It will grant 100 four-year Sears, Roebuck Foundation merit scholarships to outstanding high-school seniors who plan to enter college at the beginning of the 1956-1957 school year. It is expected that 100 additional four-year scholarships will be granted each year thereafter.

Recipients of Sears, Roebuck Foundation merit scholarships will be chosen through a nation-wide talent search, conducted by the National Merit Scholarship Corporation, for high-school seniors who can best profit from a college education.

Preference will be given to candidates who appear to possess attributes of leadership and capacity likely to lead them toward careers in, or related to, business and industry. Candidates of course also must be those who, should they take up such careers, would be likely to succeed in them.

Preference likewise will be given to candidates who plan to enroll in private, four-year, undergraduate, liberal arts colleges of high educational standing. Examples would be institutions of the type generally comprising the membership of state or regional college fund-raising associations.

Scholarships will be awarded solely on merit and without reference to financial need.

The amount of the student's stipend will be graduated according to his needs. Stipends will range from a token payment of $100 per year for

---

From the Section of Medicine, Mayo Clinic and Mayo Foundation.

Read at the North Central States Medical Conference, Saint Paul, Minnesota, November 20, 1955.

Dr. Bargen is a member of the Advisory Board, the Sears, Roebuck Foundation.

students not requiring financial assistance to full payment of room, board and tuition when this degree of support is required.

The student thus assisted assumes a moral obligation to contribute to the financial support of his college after graduation, in recognition not only of the help he has received but of his special obligation as a citizen of superior ability.

In recognition of the fact that tuition covers only part of the cost of educating the student, colleges attended by winning scholars will receive supplemental "cost-of-education" grants equal to tuition (except that tuition plus supplement may not exceed $1,500 per year).

It is estimated that the average cost of each scholarship will be approximately $1,500 per year, or $6,000 for the four years. It is further estimated that of the $6,000, about $2,500 will go to the college as a supplemental grant and about $3,500 to the student ($2,500 for tuition and $1,000 for other expenses).

Medical Practice Units

This summer the Sears, Roebuck Foundation inaugurated a plan of assistance to physicians involving the establishment of medical practice units. This is the problem in which we as physicians are most interested.

In effect, under the plan in question, the practicing physician, in making his medical skills and counsels available, becomes a medical practice unit.

Such a physician may choose to practice individually, as a self-sustained medical practice unit of one, or he may prefer an arrangement with other autonomous practitioners which would provide for common occupancy of a building, sharing of such space as waiting rooms and examining rooms, and sharing of office and medical equipment. Services of personnel, such as nurses, receptionists, technicians and, perhaps, a medical assistant, also might be shared through this arrangement.

Still another possibility is that the physician may legally merge a degree of his own autonomy, so to speak, with that of other physicians.

Whatever arrangement is chosen, it is essential that the physicians have an adequate and convenient base from which to serve their patients best.

The days in which a physician could practice medicine from his little black bag and perform operations on a kitchen table have long since passed. Today, the demands of modern medical practice require that physicians have access to good medical facilities, meaning offices in which the patient may receive the benefits of modern diagnostic techniques.

Modern medical facilities enhance the potential services of each physician by providing him with a functional workshop in which to practice his profession.

The many diagnostic tools of modern medicine call for a well-designed and functional medical office or unit. Mistakes in planning are costly, not only in terms of misspent money, but also in terms of lost time and resultant inefficiency. A physician who conducts his practice from a physical setup designed to meet his own and the community's needs can provide better medical service to his patients, since he can make the best use of his own time and facilities.

The American Medical Association is happy to co-operate with the Sears, Roebuck Foundation in making available the brochure, *A Planning Guide for Establishing Medical Practice Units.* Within its pages are practical suggestions on all phases of planning, from selection of a site through actual construction or renovation, arrangement of equipment and management.

The information in this brochure will be useful to physicians in setting up practices. It will be particularly valuable to those who are expanding their practices or who are combining forces with other physicians to develop a single modern medical facility. It answers such important questions as: Shall I build or remodel? Shall I rent space or buy? What factors should be considered in planning a medical unit? How much space do I need? The emphasis is on development of a well-planned, flexible arrangement that will permit expansion, rather than on development of an elaborate facility.

The booklet also will be of interest to community leaders who are planning medical units in order to attract physicians to their areas.

This practical planning guide, edited by the American Medical Association, has been published through a grant made by the Sears, Roebuck Foundation. Copies are being made available to members of the American Medical Association upon requests placed through their city, county or state medical societies.

The technical information in this planning

TABLE I. SEARS, ROEBUCK FOUNDATION: PROJECTION* OF INCOME FROM REVOLVING FUND AND NUMBER OF MEDICAL PRACTICE UNITS ESTABLISHED

Year	Income of Revolving Fund					New Units Established			Cumulative Units Established		
	Sears Grant	Repayment of Principal	Interest Payments	Pledge Payments	Total Income	Sears Grant	Repay-ments	Total	Sears Grant	Repay-ments	Total
1	125,000		7,500		132,500	5		5	5		5
2	125,000		15,000		140,000	5		5	10		10
3	125,000		22,500		147,500	5	1	6	15	1	16
4	125,000	18,000	24,000		167,000	5	2	7	20	3	23
5	125,000	36,000	27,000	3,000	191,000	5	3	8	25	6	31
6	125,000	54,000	31,500	7,500	218,000	5	3	8	30	9	39
7	125,000	75,600	34,500	12,000	247,100	5	5	10	35	14	49
8	125,000	100,800	39,000	18,600	283,400	5	7	12	40	21	61
9	125,000	129,600	45,000	26,100	325,700	5	8	13	45	29	74
10	125,000	157,400	52,500	34,500	369,400	5	9	14	50	38	88
11		175,400	51,000	37,500	263,900		11	11	50	49	99
12		200,600	49,500	42,000	292,100		12	12	50	61	111
13		229,200	48,000	48,600	325,800		13	13	50	74	124
14		239,800	54,000	55,200	349,000		14	14	50	88	138
15		254,000	58,500	59,100	371,600		14	14	50	102	152
16		268,400	61,500	62,400	392,300		16	16	50	118	168
17		286,000	66,000	67,200	419,200		17	17	50	135	185
18		300,000	70,500	69,300	439,800		18	18	50	153	203
19		307,000	76,500	70,500	454,000		18	18	50	171	221
20		318,600	79,500	71,100	469,200		18	18	50	189	239
21		347,000	81,000	78,000	506,000		21	21	50	210	260
22		372,000	85,500	84,000	541,500		21	21	50	231	281
23		393,400	90,000	89,700	573,100		23	23	50	254	304
24		411,200	97,500	95,100	603,800		24	24	50	278	328
25		434,900	103,500	99,600	638,000		26	26	50	304	354
Total	1,250,000	5,108,900	1,371,000	1,131,000	8,860,900	50	304	354			

*As of July 29, 1955.

guide has been prepared by the Foundation for Research and Development in Health Activities, and represents years of experience of the staff of the foundation in the field of medical-facility planning.

Mechanics of the Medical Practice Units Plan

The first meeting of the officials of the Sears, Roebuck Foundation and Sears, Roebuck and Company with the Medical Advisory Board was held on August 19, 1955.

It was stressed by Mr. Theodore V. Houser, chairman of the board of directors of Sears, Roebuck and Company, that the foundation's role is to give continuity of financial support to worthwhile programs.

Mr. Houser expressed his appreciation for the interest and co-operation of the American Medical Association and the members of the Medical Advisory Board, and assured them of the desire of Sears, Roebuck and Company to develop a consistent and continuing program.

Dr. Gunnar Gundersen expressed, on behalf of the American Medical Association, appreciation for the approach of Sears, Roebuck and Company to the problem, and said that the American Medical Association is looking forward with great confidence to the future of the project.

Dr. E. S. Hamilton pointed out that attendance at the meeting furnished concrete evidence of the interest of the American Medical Association in the project. He said that although there had been a rather widespread recognition of the problem, Sears, Roebuck and Company was the first organization to indicate a willingness to put up the funds required to work toward a solution. He said he felt that he could speak for the Board of Trustees and the medical profession as a whole in expressing his appreciation for the opportunity to work with an organization which evidently contemplates the current problem in the same way the American Medical Association does.

Dr. F. J. L. Blasingame called the meeting of the Medical Advisory Board to order. He pointed out that the American Medical Association has been organized and active in the health field for more than 107 years. He discussed the present organization of the American Medical Association, and stated that the actions of this group reflect professional opinion at the grass-roots level. Dr. Blasingame said that the philosophy and objectives of the Sears, Roebuck Foundation coincide closely with those of the American Medical Association in that both recognize that the problem is to give intelligently without damaging the recipient. He pointed out that assistance is necessary to establish a better distribution of medical manpower, and that the purpose of the Medical Advisory Board is to clarify the details of the plan and offer professional opinion on the soundness of projects as they are presented.

Mr. James C. Worthy then described the details of the medical assistance plan, emphasizing the role of the Medical Advisory Board in the evaluation of applicants, facilities and the medical needs of communities.

Mr. Ross Garrett explained briefly the procedure for processing applications:

1. The application will be sent to a territorial office of the Sears, Roebuck Foundation, c/o D/703.
2. The territorial offices will transmit the application to the Chicago office of the Sears, Roebuck Foundation, where it will be numbered in order of receipt.
3. A copy of the application, with supporting material, will be forwarded to the appropriate members of the Medical Advisory Board.
4. The final decision will be made by the Medical Advisory Board as a whole, which will also establish the priority of grants to be made.
5. When applications must be denied, this action will be taken in the name of the Medical Advisory Board as a whole.
6. After an application has received the favorable action of the Medical Advisory Board, it will be forwarded to the Board of Directors of the Sears, Roebuck Foundation, who will appropriate the requested grant up to the limits established.
7. Disbursement of funds will be handled by the Sears Community State Bank.

General Considerations

Unsecured ten-year loans of up to $25,000 each will be offered to physicians who are seeking to establish practices but who are unable to obtain adequate financing locally, the Sears, Roebuck Foundation has announced.

At least one loan in each of five regions across the United States will be granted in 1955, from an original $125,000 Sears, Roebuck Foundation grant.

The plan of assistance is being launched by the Sears, Roebuck Foundation in co-operation with the American Medical Association as an "investment in individual incentive." The foundation called it a "modest and practical plan" to "further improve America's leadership in providing medical attention."

"This is a plan aimed at creating the financial and managerial conditions best designed to satisfy the medical needs of the American people, the professional and economic needs of the American physician and the principles of free, voluntary and unregimented practice of medicine in which the physician is beholden to no 'boss' other than his professional ethics and his professional competence," the foundation said.

The plan is designed to be self-expanding, with all repayments to be used for further grants. Thus, every grant made will help to establish still another medical practice where it is needed.

The foundation said that young physicians, although they may have both skill and knowledge, often lack two essentials: capital and business "know-how." The plan is intended to fill this gap with long-term, low-cost assistance. Recipients of grants will make tax-free contributions to the foundation instead of paying interest. As has been indicated, these contributions and the repaid loans will be used to establish more medical practice units. Several features are included to encourage early repayment, thus making more grants possible.

Applications for grants will be screened by a medical advisory board, members of which have been appointed on the basis of nominations by the Board of Trustees of the American Medical Association. Applicants will be considered on the basis of need for assistance, expected use of it, and the effort and thought manifested by the applicant in the understanding and solution of his own problems.

Each applicant must provide information about the town or area in which he seeks to practice, indicating the need for medical care, medical resources already available, the possible reasons for the anticipated success of a new medical practice, and the benefits expected to accrue therefrom to the community. He also must outline his plan of action and his previous efforts at local financing, and provide evidence of his initiative. An important consideration in choosing the first five participants will be their ability to serve as their regional "models."

Physician-placement offices of state medical societies will play a major role in starting the program. The Sears, Roebuck Foundation pointed out that the plan is experimental, and that continuation of it after 1955 will depend on the reception and support given it by the medical profession. However, it is said that annual contributions are expected to continue for some years.

Applications must be sent to the office of the Sears, Roebuck Foundation in the region in which the proposed medical practice is to be established. Applications should be addressed to the Director, Sears, Roebuck Foundation, at one of its five locations.

(Continued on Page 558)

Case Presentations

Primary Adenocarcinoma of the Appendix Associated with a "Krukenberg Tumor"

S. T. NERENBERG, M.D.
H. HOFFERT, M.D.
D. POTENTE, M.D.
Minneapolis, Minnesota

PRIMARY adenocarcinoma of the appendix is considered to be a rare tumor.[1-9] Relatively few of these appendiceal lesions have been associated with metastases.[1,8,10-12] To date, we have been unable to find a single report of a primary carcinoma of the appendix associated with a "Krukenberg" type of metastases in the ovary which has not been challenged for one reason or another.[11,13,14]

The case described below is considered unique for two reasons: (1) A primary adenocarcinoma of the appendix was associated with a solid "Krukenberg" type of tumor in the right ovary. (2) Possible primary sites of the ovarian tumor, other than the appendix, were fairly well ruled out by systematic search of the intra-abdominal and retroperitoneal organs at the time of laparotomy.

Case Report

A forty-nine-year-old, married white woman was admitted to Asbury Methodist Hospital, Minneapolis, on August 24, 1955, because of gradual abdominal enlargement for six months, a palpable abdominal mass for four months, and vague, diffuse abdominal pain for six days. Physical examination was negative except for a hard abdominal mass in the hypogastric area, five fingerbreadths below the umbilicus. The mass could not be completely delineated because of tenderness.

Laboratory Examinations.—The urine was negative except for 20 to 30 white blood cells per high-powered field. Erythrocyte sedimentation rate was 99 mm./hr. (Wintrobe). Hemoglobin was 8 gm. per cent. Red blood cell count was 2,240,000/mm.^{3} White blood cell count was 7,750/mm.^{3} with a normal differential. Following blood transfusions, the hemoglobin was elevated to 12.5 gm. per cent.

Barium enema studies of the colon disclosed an extrinsic pressure defect in the sigmoid colon secondary to a large pelvic mass.

Course in Hospital.—A laparotomy was performed on August 25, 1955, by Dr. Henry Hoffert. A large solid, well circumscribed tumor replacing the right ovary was found. The cut surface of the tumor was grossly slimy; it had a greyish-white appearance and was of a firm consistency (Fig. 1). It measured 18.5 by 17 by 14 cm. and weighed 1,600 gm. A frozen section was interpreted as, "metastatic gelatinous carcinoma of the 'Krukenberg' type." A systematic search was then undertaken by the operating surgeon for the primary lesion. After careful inspection and/or palpation of the stomach, intestines, pancreas, gall bladder, liver, uterus, left ovary, kidneys and both breasts, the primary lesion could not be found. Because of the insistence on the part of the pathologist that the ovarian lesion was metastatic and not primary, attention was directed to the appendix where a bulbous deformity of the distal one-third was found.

On gross examination of the removed appendix, the lumen of the distal one-third of the appendix was seen to be replaced by a gelatinous tumor mass which infiltrated the wall (Fig. 2). A mucous carcinoma was seen extensively infiltrating the appendiceal wall (Fig. 3) in paraffin sections through the tumor mass. In some areas the neoplastic glands lay in pools of mucin. In other areas, sheets of signet-ring cells extensively infiltrated the wall of the appendix. Sheets of signet-ring cells (Fig. 4) were seen in paraffin sections of the ovarian tumor mass.

Other tissue removed included the uterus with the remaining adnexal organs (panhysterectomy) and a segment of small bowel attached to the ovarian tumor. No further tumor was found in these tissues either on gross or microscopic examination. The mesenteric lymph nodes removed with the segment of intestine were also free of tumor metastases.

The postoperative course was smooth; she was discharged on September 2, 1955, nine days following operation.

A "second-look" operation on January 17. 1956, showed numerous metastases in the mesentery and innumerable greyish-white tumor nodules implanted on the pelvic

---

From the Department of Pathology, Asbury Methodist Hospital, Minneapolis, Minnesota.

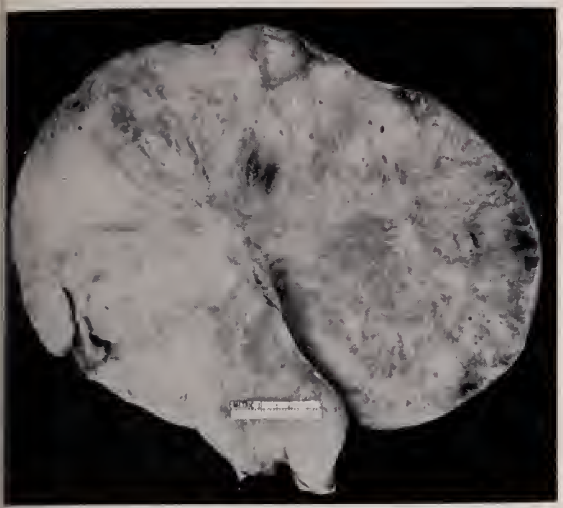


Fig. 1. "Krukenberg" tumor replacing entire right vary.

eritoneum. Nests of tumor cells surrounded by pools f mucin were seen in paraffin sections of one of the moved mesenteric nodules.

Discussion

In a majority of reported cases of primary arcinoma of the appendix with metastases to the vary, the ovarian metastases have been of a ystic nature, raising the possibility that the ovarian esion was the primary site or that two distinct rimary lesions were present.[11,13,14] The report f Driessen et al[10] of a solid "Krukenberg" type f ovarian tumor associated with a primary carinoma of the midportion of the appendix is the nly report in the world's literature with which I m familiar that is above reproach regarding a metastatic ovarian lesion of the solid "Krukenberg" type. These authors' photomicrographs of the primary and metastatic lesions are very similar to our own. The occurrence of the primary tumor in the midportion of the appendix appears to rule out the possibility that the neoplasm began in the base of the cecum.[13]

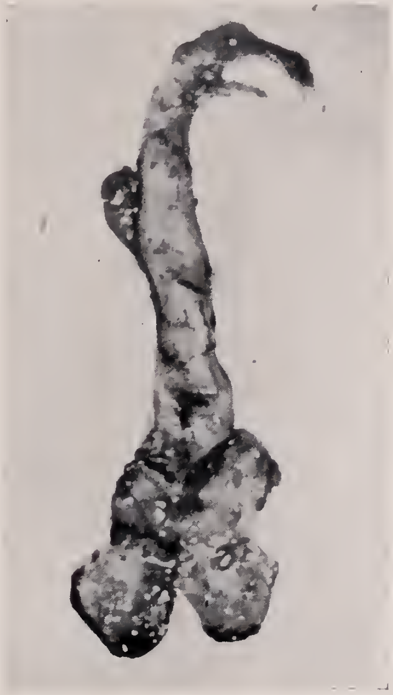


Fig. 2. Adenocarcinoma of distal one-third of appendix.

In reviewing our hospital records, three other primary carcinomas of the appendix over the past

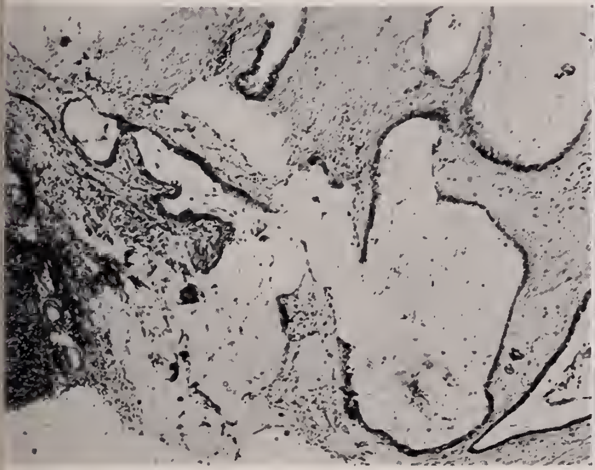


Fig. 3. Photomicrograph of adenocarcinoma of apendix (X 75).

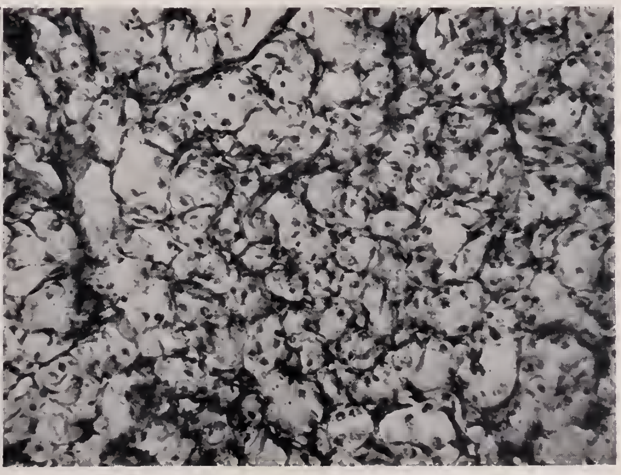


Fig. 4. Photomicrograph showing signet-ring cells of "Krukenberg" tumor of right ovary (X 150).

eight years (1947 to 1955) are listed. Two of the three cases have no description as to the portion of the appendix in which the lesion was located. In the third case, the neoplasm (of the colonic type) began in the distal portion of the appendix. It extended to the urinary bladder with creation of a mucous fistula. Four cases of carcinoma of the appendix over an eight-year period appear to be an unusually high incidence of this lesion.[1,2,4,5,8,9]

Summary

A unique case of primary adenocarcinoma of the distal portion of the appendix associated with a single, large, solid metastatic (Krukenberg type) lesion in the right ovary has been described. This forty-nine-year-old woman complained of gradual abdominal enlargement for six months, a palpable abdominal mass for four months and vague, diffuse abdominal pain for six days. At a second operation twenty weeks after removal of the primary appendiceal lesion and ovarian metastases, peritoneal implants were found.

This case is the only one of its kind which we have been able to find described in the American literature. Only one other similar case has been described in the world's literature.[10]

References

1. Botsford, T. W.; Jaques, W. E., and Claus, R.: Primary tumors of the appendix. Am. Surg., 585-594 (June) 1954.
2. Clarke, R. S., and Simonds, J. P.: Adenocarcinon of the appendix. Report of two cases. Am. Digest. Dis., 20:47-50, 1953.
3. Costello, C., and Saxton, J.: Appendicitis and ca cer. Postgrad. Med., 9:482-486, 1951.
4. Lawton, S. E., and Ehrlich, R. W.: Primary aden carcinoma of the appendix. J.A.M.A., 150:18 191, 1952.
5. Lesnick, G., and Miller, D.: Adenocarcinoma the appendix. Cancer, 2:18-24, 1949.
6. Marks, E. S., and Whitaker, H. W.: Prima adenocarcinoma of the appendix. Surgery, 27:72 725 (May) 1950.
7. Schuldt, F. C.: Primary adenocarcinoma of t appendix and carcinoid tumors. Minnesota Me 23:791-795, 1940.
8. Whipham, T. R. C.: A case of primary carcinon of the vermiform appendix. Lancet, 1:319-32 1901.
9. Young, E. L., and Wyman, S.: Primary carcinon of the appendix associated with acute appendicit New England J. Med., 227:703-705, 1942.
10. Driessens, J.; Molatray, H., and Paris, J.: Meta tase Ovarienne d'un epithelioma appendiculair Ann. d' Anat. Path., 15:668-675, 1938.
11. Harnung, R.: Beitrag zu den Beziehungen zwisch Appendix und Genitale. a. Karzinam b. Pseud myxom. Zentralblatt. f. Gynäk., 52:1630-163 1928.
12. Simon, R. et al: A propos d'un cas d'epithelion colloide atypical premetif de l'appendice. Ly Chirurgical, 48:735-737, 1953.
13. Hilsabeck, J. R.; Judd, E. S., and Woolner, L. B Symposium on surgical aspects of cancer problen carcinoma of vermiform appendix. S. Clin. Nort America, 31:995-1011 (Aug.) 1951.
14. Waugh, T. R., and Findley, D.: Mucocele wit peritoneal transplantation in adenocarcinoma of t appendix. Am. J. Surg., 37:518-525, 1937.

AMERICAN COLLEGE OF PHYSICIANS RECEIVES RESEARCH GRANT

A research grant of $43,100.00 has been awarded the American College of Physicians for the period September 1, 1956, through August 31, 1957, by the Department of Health, Education, and Welfare of the Public Health Service in furtherance of its project to evaluate internal medicine in hospitals. This project, "to establish a minimal standard of quality and efficiency of the practice of internal medicine in hospitals," was initiated in early 1956, by the College's Committee on Criteria for Hospital Accreditation, under the chairmanship of Dr. Arthur R. Colwell, Sr., F.A.C.P., Chicago.

The Director of the study is Dr. Marion A. Blankenhorn, F.A.C.P., Cincinnati, who is devoting his full time to the project. A pilot study of approximately one hundred representative hospitals is being conducted by observing practice methods with particular reference to internal medicine. Twenty or more mature and responsible physicians are being sent to selected sites to observe current practices; to record the type of patient admitted to a hospital, the diseases, length of stay and the means employed for diagnosis and treatment; and to classify findings—approved, provisionally approved, and not approved. A search is being directed to the mechanics of internal medicine as practiced in a wid variety of circumstances (large, small, voluntary, ta supported, private, teaching or non-teaching), especia ly the use of clinical laboratory devices; habits of co sultation, and use of ancillary skills such as physic medicine, rehabilitation, preventive medicine and other Such observations and records will be edited by the D rector and reviewed by the Committee on Criteria.

Whereas, appraisal of medical care will be the p mary objective, information will be gathered also r garding internships and residencies in Medicine whe such programs exist. Close liaison will be maintain with the Council on Medical Education and Hospita of the American Medical Association and appropria committees in the Association of American Medical Co leges. The Committee does not suggest that this pil study shall substitute for any part of the present pr grams of the Joint Commission on Accreditation of Ho pitals or the Council on Medical Education and Ho pitals of the AMA but will proceed parallel to th existing programs of both, probably leading to som revision in their Internal Medicine policies in the futur

Hypernephroma in Infancy and Childhood

M. P. REISER, M.D.
C. D. CREEVY, M.D.
Minneapolis, Minnesota

HYPERNEPHROMA (adenocarcinoma of the kidney, renal cell carcinoma) in infancy and ildhood is very rare. Fifteen cases appear the literature; others are mentioned but have ot been included either because the microscopic scription was lacking or it was vague and could confused with Wilms's tumors. The youngest itient was one and one-half and the oldest is fourteen years old. There were eleven boys id four girls. Of the fifteen, four either had operable lesions or died immediately after opera- on. No mention was made of a follow-up in e; five were living, three, eight, eight, twelve id twenty-four months postoperatively. One pa- ent died of recurrence of the neoplasm after ie year.

Case Report

D. K., a two-and-one-half-year-old white boy, was ad- itted on June 8, 1955. Eight days earlier he had sud- en onset of crampy abdominal pain, which recurred out every half hour, and was accompanied by vomit- g and fever. His referring physician noted a tender ass in the left upper quadrant which extended into e left costovertebral angle. Urinalysis was normal. emolgobin was 60 per cent; there were 13,000 leuko- tes with a differential count of 85 per cent neutro- hils. A perinephric abscess was diagnosed, and the atient received penicillin, terramycin and streptomycin. xcretory urogram was interpreted as showing left hydro- ephrosis with dilated upper calices and distorted lower alices.

The patient was then sent to the University Hospitals, here physical examination disclosed a well-developed, ell-nourished, rather listless child in no acute distress. he blood pressure was 140/64. There was a systolic iurmur along the left sternal border. The liver was alpable two fingerbreadths below the costal margin. A rm, freely movable, slightly tender mass, which could ot be transilluminated, extended from the left costal iargin to just above the iliac crest, and was palpable i the left costovertebral angle.

The hemoglobin was 9.9 grams; the white cell count as 12,600 leukocytes with a differential count of 52 per cent neutrophils, 41 per cent lympocytes, 6 per cent monocytes and 1 per cent eosinophils. The sedimentation rate was 111 millimeters in one hour. Urinalysis was normal except for an occasional white blood cell. Catheterized urine contained coagulase negative staphylococci in the broth only. The blood urea nitrogen was 13 milligrams per cent. No pulmonary metastases were seen in the roentgenogram.

Cystoscopy under pentothal anesthesia disclosed a normal urethra and bladder with clear spurts of urine from each ureteral orifice. Left pyelogram revealed the renal pelvis stretched out over a space-occupying lesion with dilatation of the superior minor calices and elongation and dilatation of the inferior minor calices as well as a distorted and elongated middle minor calyx. The ureter appeared normal (Fig. 1).

On June 11, the left kidney enclosed in Gerota's fascia, and seven periaortic lymph nodes were removed transperitoneally (Fig. 2). He received 3,000 tissue roentgens postoperatively. The pathological report follows:

> *Gross.*—The specimen (Fig. 3) consists of the left kidney which measures 9.5 x 8.4 cm. and weighs 300 gm. On sectioning the kidney there is a central tumor mass measuring about 6 cm. in largest diameter. This is yellow on cut surface and displaces the pelvis. It is surrounded on all sides by cortex which in one area measures only 2 mm. in thickness. The tumor does not appear to involve veins and does not show extensive necrosis.
>
> *Microscopic.*—Sections of multiple blocks of the tumor show it to be composed of large hydropic epithelial cells forming alveolar nests or clusters or developing into tubular or even papillary structures. These cells are supported by thin strands of fibrous tissue. They show oval nuclei with some variation in size and small nucleoli. There are moderate numbers of mitoses. Everywhere cytoplasm is hydropic or granular. The appearance of the tumor is characteristic of adenocarcinoma of the renal cortex. There is an apparent fibrous capsule about most of the tumor although in a few areas this is penetrated. There is atrophy of some of the overlying cortex. Elsewhere the kidney parenchyma shows no remarkable change although glomeruli are somewhat immature. The capsule of the kidney itself is thickened and shows proliferation of fibrous tissue and hemorrhage. Sections of normal-appearing adrenal gland are seen within the capsular tissue. Sections of the ureter show nothing of note. Sections of seven lymph nodes found at the hilus show no tumor.
>
> *Conclusion.*—Adenocarcinoma of the renal cortex.
>
> Paul Lober, M.D.

On August 19, 1955, examination revealed no evidence of tumor. Roentgenogram of the chest was normal.

From the Division of Urology in the Department of urgery, the Medical School of the University of Minne- ota, Minneapolis, Minnesota.

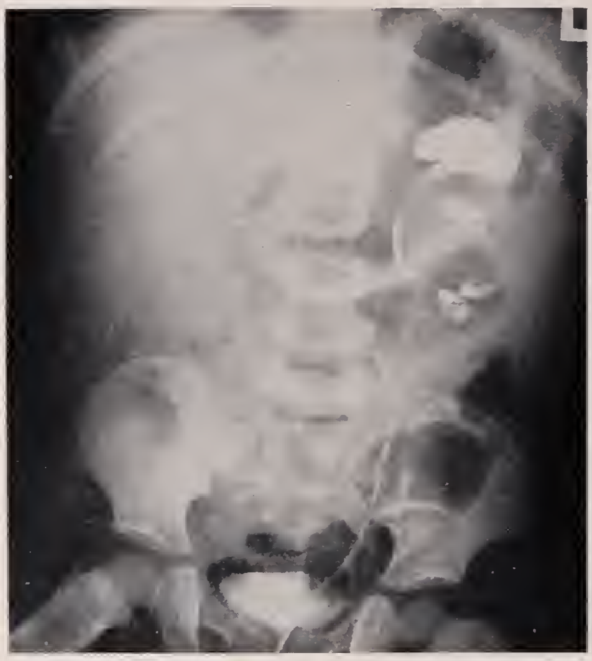


Fig. 1. Left retrograde pyelogram, with distortion of the renal pelvis and calices.

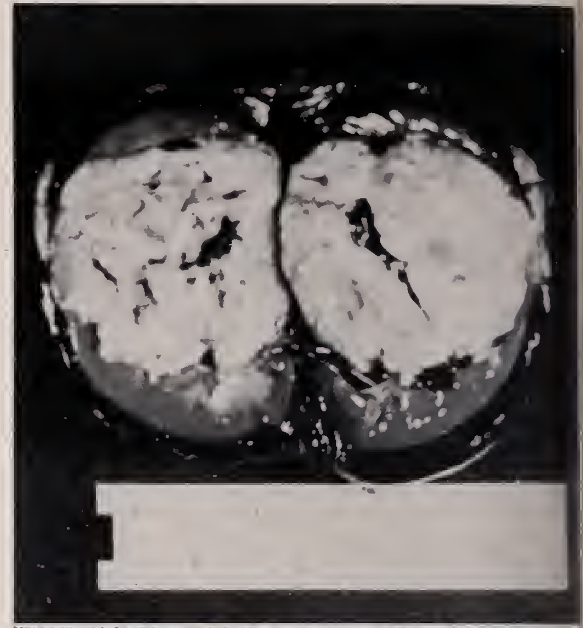
Comment

Hypernephroma is rarely observed before the age of thirty years. Hempstead et al[9] have hypothesized that this might be due either to the observed infrequency of renal adenomas prior to the degenerative years; or to the low growth potential of these adenomata, or to the tendency for hypernephromas so engendered to remain silent until considerable size has been attained.

Summary

A hypernephroma occurring in a two-and-one-half-year-old boy has been presented.

Fifteen cases of hypernephroma occurring in childhood appear in the literature.



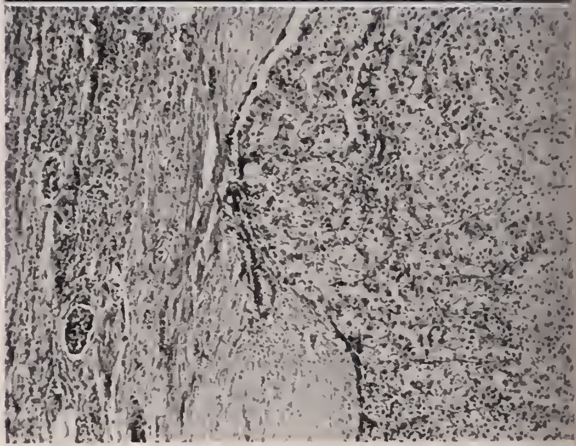


Fig. 2. *(above)* Specimen shows renal cell carcinoma.

Fig. 3. *(below)* Photomicrograph (X 95) showing hy dropic epithelial cells.

THERAPY OF SEROUS CAVITY EFFUSION

(Continued from Page 523)

fluid containing free sarcoma—37 cells. Proc. Soc., Exper. Biol. & Med., 74:638-642, 1950.

7. Knisely, R. M., and Andrews, G. A.: Pathological changes following intracavitary therapy with colloidal Au^{198}. Cancer, 6:303, 1953.
8. Andrews, G. A.; Root, S. W., and Knisely, R. M.: Metabolism and distribution of Au^{198} injected into serous cavities for treatment of effusions associate with malignant neoplasms. Cancer, 6:294-30 1953.
9. Seaman, W. B.; Sherman, A. I., and Bonebrak MacDonald: Radioactive gold in the treatment o malignant effusions. J.A.M.A., 153:630-633 (Oc 17) 1953.

Continuation Studies

PSYCHIATRIC ASPECTS OF THE HANDICAPPED CHILD

REYNOLD A. JENSEN, M.D.
Minneapolis, Minnesota

PROBLEMS associated with a handicapped child often cause the physician difficult and trying moments.

Perhaps this can be explained in terms of his own insecurities, since each child with a physical disability presents a new and different problem. Competence to deal with it requires broad experience in recognizing and evaluating all the factors influencing the child as he attempts to make a satisfactory adjustment to his world and those about him. The problem is further complicated because much of the literature concerning handicapped children has dealt primarily with the handicapping condition rather than with the child who has a handicap. In other words, the emphasis has been on the handicap itself, not on the child and his reactions to his disability.

Communicating satisfactorily with the handicapped child is a problem. As yet no satisfactory methods or techniques have been evolved for study in this area.

Helping parents develop an understanding of the disability, as well as a more realistic appreciation of their role in the child's life is difficult. From clinical experience, it seems clear that many of the emotional problems encountered in the handicapped child are directly related to parental attitudes and feelings about the child, which influence their management of him.

Before discussing pertinent questions which must be considered in the case of every child who has a disability, it is important to review briefly how the child defines himself as an individual and works out his relationships to the world about him. It is important for all of us to appreciate what actually happens as a child matures. (Incidentally, it should be mentioned that there are successive stages of maturity—the maturity of the infant, the one-year-old, the five-year-old, and so on to adult maturity which is the ultimate goal.)

From the time of birth, the human being is endowed with a potential for growth and change. Growth always occurs in a time relationship. It takes time to grow—a simple fact too often overlooked. Understanding of what can be expected of the child at each successive stage of maturation is a pressing need.

The newborn infant is normally equipped with a few essential skills which help him to maintain his own life. These skills he must exercise for himself. To mention a few: he can breathe, suckle, and eliminate. However, though he has these few independent skills, he continues to be largely dependent upon others. For a considerable period of time he is helpless, requiring the help and protection of others if he is to survive.

This need for help and protection brings him immediately into a relationship with another person, usually the mother or her substitute, which is, in reality, a social situation. Out of how he is handled in the countless experiences related to feeding, bathing, dressing, sleeping and awakening, the child begins to formulate basic notions about himself and others, and in this framework he develops techniques to satisfy his basic needs. The actual mechanics necessary to the satisfaction of his needs are important, but perhaps more important are the attitudes, feelings, and understanding of his struggle by those responsible for him. The latter are of particular importance to the child who has a disability.

It is likewise essential to know that certain stages of development may impose additional stress on the growing child and thus influence the way in which he develops his potential.

The period of early infancy is perhaps more important than we have heretofore appreciated. It is during these early days that the basic structure of the personality develops. Unusual experiences during the early months of life may exert powerful influences in later adjustment. An illustration is the case of a ten-year-old boy who was brought to the hospital with symptoms suggestive of poliomyelitis. He was most apprehensive not only about the possibility of his having polio, but more particularly about being admitted to the hospital. When it was determined he had polio and was to be admitted to the hospital, he developed a severe panic reaction which was difficult to understand. The panic was explained when the parents told of a severe ear infection in infancy which required admission to a hospital. After discharge to his home, daily visits to the physician's office were required. His fear of hospitals, elevators, physicians—yes, even "chrome" furniture—was understandable as we fully appreciated the circumstances of his illness during infancy. It may be difficult to believe that powerful feeling states generated during these early days influenced him so definitely, but it seems they did.

The process of socialization gains tempo at approximately the seventh month of life. From this point on the child is gradually required to conform to the expectations of others in terms of eating differently and in many ways assuming increasing responsibilities for self. There may be occasions when "too much" is expected "too soon" in the way of adequate performance. Often the child's frustration tolerance is exceeded, with unfortunate results.

The period from approximately eighteen months of age to thirty-six months is a particularly trying time. This span of development is of especial importance for the following reasons:

1. During this period he becomes aware of his own individuality. This tends to increase his dependency-independency struggle, which is so often misunderstood.

2. At this time he develops his capacity to communicate verbally. The inability to do so smoothly often complicates living for him.

3. He has a tremendous need to satisfy curiosity, and since his verbal facility is not yet adequate, fantasy is probably at its height during this period. Fantasy often produces wrong answers.

4. Play at this time is unstructured and solitary. The child is, as yet, unable to resolve some of life's trying problems through the medium of play.

5. Too often decisions are made arbitrarily *for him* rather than *with him.*

Two additional periods of particular stress come at the time the child begins his school career, and during the adolescent years when he is struggling with the severance of childhood ties with home in anticipation of assuming adult responsibility. These periods of particular stress have been mentioned because unusual experiences at these times prc especially significant.

What are the factors important in determini the child's reaction to physical disability? T following will serve as illustrations.

The first question to be answered is: "Is t disability one which was acquired or one wi which the child was born?" Referring to the pı vious discussion, it is not difficult to apprecia that the child who has been handicapped frc birth will develop feelings, attitudes and concej about himself quite different from those of child who has *acquired* a disability or deficienc This is particularly pertinent if the disability con either during or after the period when he h begun to define notions of himself as an individu.

It can be stated with reasonable confidence th the child's attitudes and feelings about a co genital deficiency are in most instances a mirr of the adult attitudes and concerns about hi Some years ago it was found that the conditic of ductus arteriosus could be corrected by surger Study of children with this handicap reveale them to have intelligence in accordance with tl normal distribution curve. Yet they were, in sense, more infantile in their attitudes and rel tionships than a group of unselected children comparable age.

The majority of these children had a peculia set of feeling states about themselves and abou their parents. In fact, many of them had learne to use their deficiency in a most annoying wa When frustrated or denied, it was quite easy t "get their own way" by turning "blue," by "pas ing out." or by some other device.

Following corrective surgery, these childre seemed more mature and self-assured. In all prot ability the surgical correction of their deficienc was important in effecting this change. Howeve the fact that they no longer could threaten the parents so successfully also was important. In ac dition, we noted a change in attitudes of th parents which, we believe, influenced a change i the children's attitudes.

If the disability is acquired, it is important t know at what age and under what circumstance it developed. Perhaps the two most significar periods for an acquired deficiency to develop during the eighteen to thirty-six month age or th adolescent period. This does not imply that othe stages of development are not important.

Further questions to be considered are: "Wha type of physical disability is it?" "Is it obviou others or is it not? . . . Can one see it or not?" s it a type of disability which appears periodi-lly or is it one which is present all the time?" Eczema or a convulsive disorder is a very threat-ning kind of disability observed only periodically. n amputation, a strabismus, or repair of a cleft alate is apparent at all times.)

Sometimes the lives of children with a physical isability are complicated when others take notice f it. Whenever parents, physicians, or others evelop a concern about a child's condition and stitute necessary corrective procedures, the child's actions to himself and others may change. Not ng ago a youngster came to us with a peculiar eficiency of sight in one eye. If the child's vision as to be preserved, corrective measures were ecessary. It was essential to cover up the good e to encourage use of the affected one. As soon the good eye was covered, the child's behavior hanged—not so much because he could not see s well out of the poor eye as because there was a ifference about him which was noticed.

Children with diabetes often present severe roblems of management. Their deficiency is arely apparent, yet the daily administration of nsulin, the need to examine the daily specimen, nd dietary requirements all continually reinforce feeling of difference. The question of how differ-nt the disability makes the child feel is important. As the child grows older, the question "How lisabling is this deficiency in terms of competi-ion with others?" likewise becomes important.

The circumstances under which a physical dis-bility occurs must be considered. Is this disability result of an accident, such as an automobile nishap or a fall when climbing? The feelings the hild may have about his responsibility for the ccident, or the feelings of guilt he may have about he accident may be extremely important. In nany instances the child may interpret the acci-lent as punishment which may increase his guilt eaction. These feelings may be reinforced as he enses the anxiety of those interested in him.

In illustration of the way the child's tensions nay be exaggerated, let me tell you about a seven-ear-old lad who was admitted to our hospital uffering with rheumatic fever. He was a most ebellious, cantankerous and difficult youngster. From our experience, we had found that giving uch children additional time and attention helps great deal. One of the resident staff was as-igned the task of getting acquainted with him, which was extremely difficult, for the patient did not seem to have anything to talk about. In fact, to begin with, he completely ignored the physician. However, as the patient gained confidence in the physician, he had plenty to talk about. As he began to talk, his behavior improved and he adjusted to hospital routine much more satisfactorily. At the same time, his rheumatic fever became less difficult to manage.

An interesting thing happened one day as he was talking with his physician, who had commented on his improvement. The young lad said, "Yes, you know why? I've got two kinds of pains. I've got my rheumatic fever pains and I've got my worry pains and my worry pains are much better, thank you." Many times in dealing with youngsters with chronic disabilities we forget "worry pain."

Toby was with us for three years in the hospital. More than 60 per cent of his body surface had been burned. It took three years to rehabilitate him. In retrospect, part of the reason it took so long was that we were not aware of the fact that he had never reconciled his own feelings about the circumstances at the time he was burned. Back in the recesses of his mind he had harbored the suspicion that the youngsters with whom he had been playing had deliberately pushed him into the fire. Once he began talking this out with us, his physical disability seemed to improve more rapidly.

Another question which requires clarification is: "What is the child's concept of his disability?" Always a problem with adults, it is an even greater problem with children. Fantasy, misinterpretation, guilt, fear, and the lack of satisfactory means to resolve them tend to distort the child's concept of his disability, and hinder progress in adaptation.

Several years ago a fellow colleague was assigned to a rheumatic fever convalescent ward to determine what might be done to relieve the management problems occurring on this particular ward. The chief problems were as follows: (1) the children would not stay in bed (a must for most patients with rheumatic fever): (2) not only were these children overactive, but extremely tense and nervous, with more than the usual amount of fighting and quarreling among themselves; (3) in addition, these children had a particular knack of involving the adults on the ward in their troubles; (4) most of the children refused to eat properly.

In the course of the investigation, it was learned the children had not understood why the physicians and supporting staff managed them as they did, why the many denials and prohibitions, why the inconsistencies—all of which led to considerable worry. The staff was encouraged to listen to the spontaneous comments of the children among themselves. These provided many leads. One girl spoke of someone dying from rheumatic fever. Another wanted to know if, when she was married and had children, her children would have rheumatic fever. Many were concerned because their illness took them away from home, some for the first time. Reading newspapers and magazines about heart disease, its complications and the sudden deaths which do occur caused many to worry about what would happen to them. It was also learned that the uncertainties of some of the staff members had an adverse effect on the patients.

After a period of observation and study, the basic problem was clear. To quote the physician: "I began to realize, as did some of the rest on the station, that we had a bunch of scared children on our hands." So, he and the staff began experimenting with methods to get at these "scared feelings."

How was this done? First by making the hospital as homelike as possible. Parents were consulted and counselled. More time was devoted to the children themselves rather than to their illness. Discussions were arranged with small groups during which questions were honestly answered. When unusual procedures were to be performed, they were clearly explained to the child. And finally attention was given to relieving some of the staff's own anxieties. It was not long before the ward was transformed into a place where children were happy, contented and co-operative.

One significant point, which has been mentioned several times, must be emphasized again since it is so extremely important in the life of any handicapped child. It is most essential for parents and substitute parents (physicians, nurses, teachers, and others) to examine and understand their own feelings and attitudes about the child and his handicap. Can we accept the child as he is with his handicap? Have we clarified our own role in helping the child realize in his own way his full potential? The subtle but none the less very real influence of our own thinking, feeling, and doing cannot be ignored, for it is an important factor in how the child learns to use his handicap in meeting life's situations.

Will he learn to use his disability to excuse his failures? Many do. Inevitably this leads to unhappiness and dissatisfaction. Some years ago, an effort was made to help a fourteen-year-old girl who was excessively obese—a most distressing handicap to an adolescent girl. She was attractive, superior intelligence and very capable. Howeve our best efforts failed for she had so successful learned "to hide behind" her obesity.

Will the child learn to deny the existence his handicap? Until recent years, it was commc for many adults handicapped by deafness to der their disability, which resulted in discomfort n only to the individual himself but also to tho associated with him. Children learn to deny the disabilities—usually from adults.

Will the child learn to accept his disabili without threat and learn to live with it? Succes ful living for everyone is dependent upon full a ceptance of shortcomings, whatever they may b Everyone can recall friends and associates wh have attained this goal and who live full, ric satisfying lives. The realization of this goal fo the handicapped child will assure for him, too, rich, full life—whatever his disability.

How can we help him achieve this goal? B keeping foremost in our minds that the primar interest must be in the child, rather than in h handicap; by helping him come to as complet acceptance as possible of his disability, whatever may be, at the earliest possible moment; by an swering his questions to his satisfaction, thus allay ing excessive fear and fantasy and avoiding mi interpretation; by preparing him adequately fo his leaving home if he requires special help, an for his return; and while away from his home, b assuring him of continued support from his par ents as well as others interested in him.

The education of the parents in the under standing of the handicap is likewise important, a is the clarication of doubts, worries, attitudes an feelings about the child and the future. Achievin the latter objective may be a long and laboriou task, but most essential.

In addition, we who are engaged in professiona work need to re-examine our own problems an insecurities as they are related to the handicappe child. We need to come to an acceptance of ou own limitations and an understanding of our re spective roles in the life of the child and h parents. We should strive assiduously to develo our professional skills in helping both child an parents to deal more constructively and realisti cally with each problem situation as it arises.

With adequate support, understanding and ac ceptance of the handicap, whatever it may b most children can learn to live a useful and ric life in the successful mastery of each passing da

FUNCTIONAL HEART DISEASE

GEOFFREY BOURNE, M.D.
London, England

The label "functional heart disease" includes those conditions in which symptoms suggest to a patient that the heart is abnormal, or signs which may suggest a similar conclusion to the examining physician. Functional heart disease is of great importance; first, because fifty per cent or more of the practice of most cardiologists is composed of patients who in fact have no organic cardiovascular lesion, and, second, because it is a more constructive social measure to be able to return such individuals to normal life disabused of their fears than to treat patients who in actual fact are suffering from some cardiovascular disability.

The elucidation of symptoms, or what is technically known as the clinical history, is of paramount importance in this association. The more skilled the clinician and the more intelligent the patient, the more clearly do these symptoms attain their true value. The chief symptoms of functional heart disease are exhaustion, palpitation, left chest pain, sweating, faintness, and dizziness. The presence of many such symptoms suggests a functional disorder, whereas the presence of a single symptom in isolation always suggests an organic cause.

Functional cardiac pain is such an important manifestation that its fuller consideration is left to a later article.

Shortness of breath on exertion is the paramount symptom of organic cardiac failure, but this also is often complained of by individuals suffering from functional heart troubles. They however will confess when closely questioned that of the two symptoms, dyspnea and exhaustion, the latter symptom is the more severe. Palpitation and heart consciousness usually coexist with exhaustion and dyspnea in such cases.

There is another type of shortness of breath which is in fact not true dyspnea. The patient will not always make a clear distinction between the two varieties unless carefully questioned. What is really complained of is an inability to take a sufficiently deep breath. This particular symptom is especially common in patients who are psychologically rather depressed, nervous, and anxious. They are seen to have a respiration punctuated by sighs and varying in depth. X-ray screening will often show that the diaphragm does not descend with its usual free movement.

Palpitation is in most cases an indication of nervous hypersensitivity or anxiety rather than of organic disease. It is particularly noticed after exertion, or from an emotional cause, or as the patient lies in bed before sleeping. Palpitation may also be due to premature beats, when, of course, the history elicits from the patient consciousness of a single heart throb or of a momentary sinking sensation. Paroxysmal tachycardia may be a cause of palpitation in otherwise normal hearts. Here again an exact history is essential for the diagnosis. The patient will always be able to describe the sudden onset of the attack, the termination may sometimes be less easy for the patient to define.

Even in terms of death rates from tuberculosis alone, the future task is large and prolonged. It will require years of effort to achieve a death rate of only 1.5 per 100,000 population, which is about the current death rate from acute rheumatic fever, appendicitis, arthritis, poliomyelitis, and several other diseases which are still considered to be of public health import. The maternal mortality rate is about at that level. Measles, whooping cough, and infectious hepatitis combined, do not exceed it. When the death rate from tuberculosis drops to the level of these important diseases, then tuberculosis control programs and needs should be re-examined.—Robert J. Anderson, M.D., Public Health Representative, Feburary, 1956.

Dr. Bourne is Physician-in-Charge, Cardiological Department, St. Bartholomew's Hospital, London, England.
This is the first in a series of four articles by the author on this subject.

Tumor Conference

Section Editor
C. R. Hitchcock, M.D.

Case Study—M. G. H. 53361

The patient is a sixty-four-year-old woman who came to the Minneapolis General Hospital with a short history of right lower quadrant discomfort and a mass in this area which the patient could palpate. On admission her hemoglobin was found to be 9.6 gm. and a barium enema x-ray examination revealed a large tumor mass in the cecum with involvement of the ileo-cecal valve. The small bowel was not obstructed.

On November 8, 1955, a radical right hemicolectomy and ileotransverse colostomy were performed. The tumor mass had invaded into the anterior and lateral abdominal wall and it was necessary to remove a large portion of the abdominal wall musculature in the resection of the tumor mass. The mesentery of the ileum was resected as far above a large group of involved lymph nodes as possible, and 40 cm. of terminal ileum had to be resected. Some of these lymph nodes were 3 to 3½ cm. in diameter.

During the initial operation the rest of the abdomen was found to be free of any evidence of tumor and the liver was also negative for metastases.

The patient has done well in the intervening months, and on May 2 was operated upon for a "second look" procedure. During the course of this operation all adhesions were lysed and the entire area of the abdomen was searched minutely for possible evidence of neoplastic disease. One nodule in the anterior abdominal wall close to the incision was removed and on frozen section proved to be scar tissue. (Paraffin section confirms this diagnosis.) In performing an exploration of this kind all lymph node bearing areas of the peritoneal cavity are thoroughly examined both by inspection and by palpation. This patient was deemed negative on her "second look" procedure since no lymph nodes or other suspicious areas were found.

Recent experience has demonstrated the value of re-exploration of patients in the asymptomatic phase of their postoperative period with the intent to remove any remaining areas of metastatic tumor. Lesions in the right colon and the sigmoid colon have proved to be most beneficial with this approach. This patient was considered an ideal candidate for the "second look" program because of the location of her lesion and the extent of the tumor invasion locally; also, the extent of involvement of lymph nodes in the immediate neighborhood of the primary cancer increased the likelihood of occult nodal involvement at sites more distant from the primary at the time of the initial operation. The patient has recovered from the "second look" exploration and will now be followed at three- to four-month intervals in the tumor clinic.

Case Study—M. G. H. 98389

This fifty-two-year-old white male patient entered the hospital with a five day history of dyspnea, cough productive of white sputum, and ankle edema. During the previous month the patient thought his abdomen had been increasing in size.

Past medical history was nonsignificant except for an intra-ocular hemorrhage in the left eye treated in another hospital three months previously. It could not be determined accurately whether trauma preceded the ocular hemorrhage or whether it was spontaneous. The patient was known to use large quantities of ethanol during recent years.

Physical examination revealed a florid faced man with cyanosis of his lips and nails. Temperature was normal, pulse was 120/minute, and blood pressure was 95/75. Neck veins were prominent, and there was symmetrical decrease of breath sounds over both the right and left chest. Heart tones were decreased and muffled. An abdominal fluid wave was present, and the liver was enlarged well below the umbilicus.

For the first three days the patient was treated for his heart failure with digitoxin and low sodium intake. Penicillin, heparin, and Dicumarol® were also administered. With no improvement in general condition and appearance of paradoxical pulse, fluoroscopy was performed and revealed absence of pericardial pulsations. A pericardial tap removing 300 c.c. of bloody fluid resulted in an immediate improvement of blood pressure to 128/78 and disappearance of the paradoxical pulse. Two days later the urinary output had increased from small amounts daily to 4000 c.c. daily. Routine cytologic examination of the pericardial fluid revealed the presence of malignant cells.

The nature of the malignant cells could not be established in the smears, but the cells were compatible with either metastatic cancer or a primary mesothelioma of the pericardium. Since examination of thoracentesis fluid had revealed the presence of cells similar to those from the pericardium, the possibility of mesothelioma primary in the pleura and extending into the pericardium also was entertained. The patient's condition did not permit extensive search of the visceral organs for a possible primary cancer by roentgenograms or endoscopic examinations, but chest x-rays were normal with respect to intrinsic pulmonary lesions. Repeated pericardial taps were necessary every two to three days to maintain life.

In order to relieve the continuously recurring peri-

This tumor board program is sponsored and supported by the Minnesota Division of the American Cancer Society.

cardial tamponade, and permit the patient to improve such that further studies might be performed, a pericardial marsupialization was performed. A portion of cartilage of the left fourth rib was removed anteriorly and the pericardial sac sutured to the subcutaneous fascia. Considerable quantities of bloody material drained from the pericardial sac during the next few days. The histologic diagnosis of the tissue removed at surgery was probable metastatic carcinoma but the pathologist again was unable to rule out the possibility of a mesothelioma. He was satisfied that the sections did not represent metastatic malignant melanoma (a diagnosis entertained on the basis of destruction of the left eye previously due to questionable spontaneous intra-ocular hemorrhage).

A week later further improvement in the cardiac function was attempted by means of a thoracotomy and decortication of the ventricles of the heart. During this operation the pericardium was found to again be in a state of tamponade and it was apparent that the opening through the chest wall had been sealed off by rapidly growing tumor. The patient's blood pressure improved immediately upon removal of large areas of the pericardium. It was impossible to decorticate the heart muscle itself. The patient had a progressively downhill course following the last operation and expired on the fourth postoperative day.

The gross findings at autopsy revealed the heart muscle to be infiltrated with tumor cells, but no site of a primary tumor was obvious. However, a small area of roughening in the mainstem bronchus to the left upper lobe proved on histologic sectioning to be an adenocarcinoma. There was no gross involvement of the peribronchial tissue and there was no obstructing lesion within the bronchus itself. This lesion had not been demonstrated on chest x-rays taken on numerous occasions.

Mesotheliomas, primary in the pericardium, do exist but they are rare. Whenever one is dealing with the problem of pericardial fluid containing neoplastic cells the first consideration must be that of metastatic disease. When pleural fluid is positive for tumor cells the likelihood of the primary disease residing in pulmonary tissue is great. In this patient we can only conjecture whether a bronchoscopy and bronchogram would have demonstrated the area of primary tumor in the left upper lobe bronchus prior to surgery. Where the patient's general condition will permit vigorous search, all organ systems of the body must be carefully surveyed by every means available to rule out the site of a primary before the tentative diagnosis of mesothelioma can be seriously entertained.

CURE IN LOCALIZED LARYNX CANCER REPORTED

Two California radiologists, L. Henry Garland, San Francisco, and Ian MacDonald, Los Angeles, have suggested organization of "Saved Chord" societies for patients with localized cancer of the larynx who have been cured by radiation therapy.

Their report on results from radiation treatment for localized larynx cancer was presented in the March, 1956, issue of the *Bulletin*, published by the California division of the American Cancer Society.

The two specialists pointed out that cancer of this organ does not always mean loss of speech.

"What is necessary is complete removal or destruction of the cancer. This frequently means removal of both vocal chords. . . . Adroit use of swallowed air enables many persons to learn to articulate with considerable ability. Many communities have organized 'Lost Chord' societies to aid in the instruction of these laryngectomees," the two radiologists reported.

Radiation therapy, on the other hand, sometimes can save the vocal chords—and speech, they added. Thus, the possibility of "Saved Chord" societies.

"In California, radiologists and other clinicians including the authors have been treating cancer of the larynx with a complete course of x-ray therapy since 1932 and have records of patients cured for ten, fifteen and more years," they added.

Other conclusions advanced:

—The curability of early or localized cancer of the larynx by radiation therapy is essentially the same as that by surgery. (About 85 per cent of such cases are permanently cured by either method.)

—Fear of losing their voices has caused some people to wait too long before allowing their doctors to begin treatment of a cancerous growth.

—In selected cases of advanced cancer of the larynx, in which the regional lymph nodes of the neck are involved, very radical surgery may be more advisable than radical radiotherapy, but in general the increased use of radiotherapy is reducing the number of persons who lose their voices as a result of cancer.

" 'Saved Chord' societies would remind people that localized cancer of the throat is curable, and that a normal voice may be retained by the patient," Drs. Garland and MacDonald concluded.

Editorials

John F. Briggs, M.D.
Arthur H. Wells, M.D.
Henry G. Moehring, M.D.

INTRACARDIAC PRESSURE TRACINGS

A "Look" Inside the Heart

The developments of cardiac catheterization and the importance of the data supplied by this method of investigation point out the need for a technical evaluation of the pressure tracings. As is well known, these tracings are recorded by introducing a long and thin catheter into the right side of the heart or the vessels of the lesser circulation. It is unfortunate that the necessary flexibility of the catheters somewhat decreases the accuracy of the tracings. The catheters are connected with a strain gauge or an electromanometer so that the best degree of amplification can be selected and even minute pulsations can be magnified and recorded. The recording is done by means of an electrocardiograph through use of its galvanometer and its mechanical or optical systems.

Two main purposes can be served by these pressure tracings—the estimation of the level of pressure and the study of the pattern of the pressure pulse. Even though observation of the pattern is sometimes necessary for identification of the chamber in which the catheter tip is located, somewhat different techniques should be used in order to accomplish the two above purposes.

1. For *pressure recording,* the direct writing electrocardiograph is perfectly adequate. The amplification should be moderate, record of the baseline and calibration are essential, and special attention should be paid to the exact zero level. The speed of the film which allows for easy grasp of the changes of pressure is *a low speed.* In contrast with the currently used speed of 25 mm/sec., speeds of 10, 5, or even 2.5 mm/sec. should be preferred. The sudden changes revealed by "pulling back" the catheter from one chamber to another are then particularly evident. The electrocardiogram should be observed on an oscilloscope or on a different portable apparatus so heart rhythm may be continuously observed.

2. *For recording the patterns,* a different technique should be used. This is based on photographic recording, high magnification, and high film speed (75 mm/sec.). For "timing" the waves of the pressure tracing, a phonocardiogram is simultaneously recorded. For this purpose, preservation of the original baseline is unnecessary and the beam is shifted downwards until the amplitude of the pulse is the best within the width of the film.

Both kinds of tracings, the low-speed and the high-speed, are complemental. If it is preferred. they can be both recorded by means of a two-channel photographic cardiograph (changing from time to time the speed of the film) while the electrocardiogram is observed on an oscilloscope or is recorded with a small direct writing electrocardiogram.

No mention has been made here of oxygen determinations. They represent a necessary part of the catheterization technique but are, in general, not obtained by means of graphic methods.

Aldo A. Luisada, M.D.
Chicago Medical School

WATER CONSERVATION

Nature's merry-go-round in all of its complexities and intricacies has been going on throughout the centuries without too much intelligently directed concern from even learned men and women Almost every school youth knows the secret o hydrologic cycle; precipitation comes to earth i the form of raindrops and snowflakes, gathers i our puddles, lakes and streams as surface water some of it seeps through the soil to be retaine somewhat longer, some is transpired by crops grasses and forests, the rest runs on to the se and the ocean, evaporates to the clouds and i precipitated again upon the earth. An elementar conception, to be true, but altogether too apt description of the extent of the present genera knowledge of water conservation.

In many parts of the United States, and i Minnesota particularly, water has been more o less taken for granted. Over the years the movement of people has been largely determined b water—a sea or river port, the confluence o streams, a sparkling spring, an oasis, a waterfal or any of the other munificent advantages o water. However, our knowledge of water has grown much like Topsy, with hindsight rather than foresight creating an awareness of the significance of water.

The development of the science of water conservation has been too long deferred. Warnings of water shortages are heard about the nation. Newspaper headlines announce that "Water Shortage Becomes Limiting Factor in Nation's Growth," and in the same serious vein inform us that "more than 1,000 American cities have water shortage problems." Even in the "land of sky-blue water" communities are asking the state and federal governments for professional counsel and financial aid to help solve their water problems.

What our nation needs, and what Minnesota needs desperately and immediately, is basic information about our water resources, ground and surface, and an understanding of the policies that should apply to the various but always inter-related phases of water realization. The specialist interested in but one of the many facets of water use alone is no longer sufficient. We need more than the hydrologist whose interests are primarily academic or statistical; civil engineers who think in terms of floods and siltation; agriculturists who are confronted with irrigation, drainage and erosion; departments of health that deal with potability and pollution; recreational groups intent on swimming, boating, hunting or fishing; power companies concerned with the building of dams and the attendant volts and amperes. We need the professional water conservationist who has the perspective to integrate the different emphases into a unified economical program. We must have someone with the broad overview that will co-ordinate the uses of water for domestic, municipal, agricultural, industrial, transportation and recreational purposes.

Nature's merry-go-round with water will continue to the end of time with the earth's total supply remaining ever constant. The challenge is to develop the policies that will lead to a wise and economical use of this basic resource. With our rapidly growing population and the ever increasing per capita demand for water, it is imperative for our future health, happiness and prosperity that we give top priority to the conservation of this vital natural resource.

George A. Selke, Ph.D.
Commissioner, Minnesota
Department of Conservation

BANK COUPON AND COLLECTION SERVICES

Certain issues of United States Treasury Bonds and almost all issues of municipal and corporate bonds are sold with interest coupons attached. These entitle the holder of the coupon to collect the periodic interest payments as they become due. When the interest becomes due, the coupons must be detached from the bonds and the amount of cash which they represent collected. The safest and simplest method of collecting a coupon is to present it to a bank's coupon department. That department will use established correspondent banking channels to transmit the coupon to the city in which it is payable, where it will be presented to the debtor for payment. When the payment is collected, it is remitted to the coupon holder's bank. There the payment is credited to his checking or savings account or handled in any other method he has specified.

When a bond falls due, the principal amount is collected in a similar manner. These same highly-developed banking facilities are available for performing other collection services for bank customers. For example, a promissory note, an order bill of lading, a warehouse receipt, a stock certificate, or any other valuable written instrument can be delivered to the holder's bank with the request that it be transmitted to a distant city and surrendered there by a correspondent bank only against a specified payment. If the agreed payment is not forthcoming, the correspondent bank will not surrender the instrument. If payment is collected, a nominal charge for the service performed will be retained and the balance of the payment remitted to the holder's bank.

A bank's coupon and collection department offers an inexpensive and extremely convenient method for collecting interest coupons, maturing bonds, or other payments which are to be made only on the surrender of a valuable paper.

Clarence G. Frame, *Cashier,*
First National Bank, Saint Paul

INTRODUCTION TO PHOTOENGRAVING

Photoengraving for letterpress printing is a mechanical method of reproducing the subject on metal. It may be a drawing or a photograph and is printed on metal and etched to a predetermined

---

This is the first in a series of editorials on photoengraving.

depth by the application of an etching solution. The quality of the resulting etching or halftone will depend upon the quality of the original. Because of this, I want to discuss the selection of this original copy.

The value of an illustration is determined by how good it tells its story, whether it is an illustration to augment a technical treatise or a picture of a family group. It stands to reason that a little extra care and perseverance in securing the right photograph or drawing will pay for itself many times over in the story it tells.

In the production of an ideal piece of work of any kind, it is necessary that the steps leading up to that ideal be as nearly perfect as time and thought can make it. When planning any kind of illustration, whether it be a photograph, or a drawing in pen and ink or crayon, a water color or a transparency, we should always keep in mind that the reproduction can be no better than the original subject, or very little better because the reproduction is primarily a mechanical process. Given good copy and a skilled technician, the result will be highly satisfactory. The most expert operator can do little to improve on bad copy. It is true that poor copy can be corrected by further work on the original by an artist, but this is not only expensive but often can be detected as having been added, even though it may be expertly done.

It is not necessary to furnish copy in the exact size it is to be reproduced. It can be either enlarged or reduced in size to fit the required space by the camera operator. It can also be cropped on sides, top and bottom to get the right proportion and eliminate background which does not help tell the story. We should keep in mind that the finished work will always be of the same proportion as the original, even though it may be larger or smaller in size.

In selecting your photograph be on the lookout for distortion and halation. Distortion can be corrected to a degree but does involve another camera operation with accompanying additional expense. This is equally true of halation. This can be corrected by further work on the photograph by an artist; however, it would be far simpler and less costly to use non-halation plates or film or sprays wherever possible. When more than one photograph is being used in the same story or article, it is important that the photos selected have the same color values, so that the illustrations used have a pleasing and cohesive appearance. It should be apparent that they are all definitely part of the same story. As we stated before, good reproduction starts with good original copy—therefore this emphasis on selection of subject matter.

In subsequent articles we will tell you how photoengraving is made, what constitutes copy for etchings, for halftones and for color reproductions, and how color in a transparency is separated into its component colors for reproduction.

W. W. Chreiman
Manager, Graphic Arts Division
Buckbee Mears Company

OUR NEW FRONTIER

Horace Greeley, had he lived today, might very well have said: "Go north, young man, go to the North Shore." Northern Minnesota is our new frontier. This frontier must be credited primarily to the discovery of the taconite process, a frontier opened up by research as opposed to the geographic frontiers of the explorer or the prospector. It promises an entirely new era for the North Shore.

In retrospect, it was in the early seventies that iron ore was discovered in the vicinity of Vermilion Lake. It presaged the development of a gigantic new industry in our state. Because iron ore constituted a nonrenewable resource, the governing bodies imposed certain legislative restrictions on mining operations to delay the day of ultimate depletion.

Nevertheless, the demands for iron by the nation and the world through the years constituted a heavy drain. In fact, Minnesota out-produced all other states combined or any nation of the world in ore production. Minnesota actually mined and produced the iron ore to win two World Wars. No state contributed as much or more to the war effort. But under these exigencies of war, drastic inroads were made upon high grade ore; we literally skimmed the cream of our deposits. In the past decade the industry began noticeably to slow down.

Minnesota was faced with the dilemma of finding the answer to the utilization of low grade ore or lose an industry. Years of research followed. Thanks to the research facilities of the University of Minnesota, and particularly to the genius of Dr. E. W. Davis, Professor of Mining Engineering, the taconite process was evolved.

A visit to the North Shore and Iron Range hould list high on the travel agenda for any Minnesota family this summer. Entire cities have mushroomed over night. Cities like Beaver Bay, Silver Bay, Taconite City, Hoyt Lake and many others. Imagine, if you can, a typical unit of a taconite plant a quarter mile long, just a part of a $300,000,000 development of one company on the North Shore. Dream, if you can, of cranes with fourteen-story booms, $250,000 power shovels, $48,000 trucks with 400 horsepower motors and $130,000 jet-piercing drills as just ordinary working tools. "It simply defies the imagination," gasped one visitor. "Even when you see it you can't believe it."

All Minnesota rejoices with Duluth, the North Shore and the Iron Range in the development of he taconite industry and the New Frontier. The discovery of the taconite process has assured Minnesota the mining industry for another 100 years. Once again research has crossed a NEW FRONTIER.

George A. Selke, Ph.D.
Commissioner Minnesota
Department of Conservation

REHABILITATION IN PULMONARY TUBERCULOSIS

The Altro Workshops and Papworth Village Settlement continued and grew in spite of opposition. Critics forecast disaster to the village. First, they said the whole village, especially the children, would be wiped out in a hot-bed of tuberculosis, and later, when time was proving them wrong, that the children would develop clinical disease once they left the shelter of the village for open industry and city life. After-histories, now into the third generation of original settlers, have shown an entirely opposite result, for to date there has been no proven case of meningitis, lung or bone disease in any child born of a tuberculous father after the date of his settlement.

Every tuberculosis worker will admit that this record and the teaching behind it would, in themselves alone, justify the establishment of Papworth. That education and segregation of the tuberculous are big factors in the avoidance of childhood infection every worker in tuberculosis will admit; we have yet to assess the cost of their loss in the present debunking of sanatorium treatment. Better standards of living have not so far replaced this fundamental duty to the public in the matter of contact infection. As recently as 1953 an investigation in tuberculous households in a town in Northern England showed that 4 per cent of the children had been infected. 258 were traced. Within two years, sixteen had developed skeletal disease, forty-two meningitis or miliary tuberculosis, and thirty-six were dead. The lack of ostracism in the community of Papworth, the security of work at trade union rates and of housing at low rentals, the continued watch on chest and general health of the patient and his family, and the continual education on the dangers of gross infection, are all factors in the production of the Papworth record. The exposure of the children to many minimal infections but no gross infections may be a major factor; it may be that they acquire thereby a sound and unbreakable immunity for life. Whether this be so or not, we know that up to 1950 all the children of Papworth were tuberculin-positive by natural infection, usually by the age of thirty months. Seventy of the village boys served on the Death Railway in Siam, where active disease developed among the prisoners in greater proportion than in any other prison camp outside the horror camps in Germany; yet none of the seventy returned with tuberculosis. Since March, 1950, B.C.G. (Pasteur Institute) has been given to children born into positive households, because of the fear of infection by a bacillus resistant to drugs and antibiotics. Whatever the result may prove to be, it cannot better the past record of one hundred per cent success.

Similar education of the expatient-worker can be provided in a sheltered workshop. The teaching of the sanatorium or the chest clinic on his own after-care and on his duty to his contacts can be repeated during the months or years of controlled work that are found necessary for his individual physical and functional disability.

R. R. Trail, M.D.
London, England

THE HISTORY OF GLASS CONTAINERS

After the smoke settled from the American Revolution, a few new glasshouses bravely opened for business. There were, however, only nine or

---

This is the third in a series of editorials by the author on this subject.

This is the fourth in a series of editorials on this subject.

ten in the entire country at the time. John Frederick Amelung came to America from Germany in 1784 and established the New Bremen Glass Works at Fredericktown, Maryland. Amelung failed in 1796, and some of his workers migrated across the Alleghenies to western Pennsylvania and Ohio to establish a new industry. Glass plants were also operating in New Hampshire, Massachusetts and Connecticut at the close of the century.

Early in the 1800's, American glassmakers began to manufacture the now famous "historical flasks" or "memorial bottles." Emblazoned with the likeness of American heroes, presidential candidates, and a smattering of those who were not celebrated but wished to be, these bottles soon flooded the country. The opening of a canal or a railroad, the launching of a steamer, were all fittingly commemorated in glass, as were slogans, emblems and mottos without number. Popular, too, was the American eagle which appeared in numerous poses on countless bottles, all of which were quickly bought by an avid and patriotic public. Though they were originally made to hold cider or liquor, housewives treasured these bottles, refilling them again and again with other liquids.

Manufactured from the early 1800's until about as late as 1870, these historical flasks did much to bring bottles into more common use in America. As glass containers became more widely appreciated, they were put to an ever-increasing number of new uses. In 1841, the first nursing bottle was patented. In 1858 came the Mason Jar with its threaded cap. More and more medicines, requiring the protection which only glass can give, were glass-packed. And, in the middle 1880's, Dr. Harvey D. Thatcher perfected the first milk bottle.

America's first preserving operations were started in 1819, one in Boston, the other in New York. In Boston, William Underwood packed fruits, pickles and condiments in bottles. In New York, Thomas Kensett and Ezra Daggert packed the first salmon, lobsters and oysters the same year.

In 1825, Kensett was granted the first American patent on the tin container. American bookkeepers began to abbreviate "canister" to "can," and a new word was born. The subsequent word "canning" came to mean the sterilizing and sealing of food in airtight containers whether the container was tin or glass, and whether the process was done commercially or at home.

Throughout the 19th century, an ever-increasing number of products were packed in glass, and an increasing number of glass jars and bottles were thus making their way into American homes. Important to note, however, is the fact that every single one of these bottles was made in the same way that glass bottles had been made for nearly two thousand years. Craftsmen gathered molten glass on the end of a blowpipe, lowered it into a mold, and blew into the pipe for the final shaping. At the end of a twelve- to fourteen-hour-day, the total output of a blower and four assistants was not often more than eighteen dozen bottles.

John M. Foster
Foster-Forbes Glass Co.
Marion, Indiana

PAY TELEVISION?

The statistics of television are amazing, even in an era marked by amazing statistics. Today, 97 per cent of the American people can watch TV, on one or another of 37 million television sets in homes from coast to coast. And watch TV they do—on an average of five hours a day.

It's these TV families, with this TV habit, who are in the middle in one of the loudest arguments of the brief ten-year history of television. Shall a system be started wherein people shall pay for programs televised through some of the limited number of TV channels? These are the basic arguments:

PRO: To ask a viewer to pay for the programs he sees by putting coins into a device on his set or by charging them like long distance telephone calls is no different than asking a viewer to buy a television set.

CON: Thirty-seven million people have already bought television sets under the assumption they would pay nothing more to see TV.

PRO: Pay TV will bring you championship prize fights, new movies, and first-rate Broadway plays.

CON: There aren't enough championship fights, new movies, and first-rate Broadway plays in a year to make it worthwhile, even if producers were willing to kill the box-office. You can now see the World Series, the best of the football games, and the Bowl games on your TV set free.

PRO: Pay TV will provide cultural programs such as symphony concerts, ballets, and educational features.

This is one of a series of editorials by Mr. Godt on the subject of television.

CON: Establishment of a pay TV system in a large city would cost millions; operators would have to play to the largest possible audiences. Concerts, ballets, and educational features don't attract the largest audiences.

PRO: Pay TV will supplement free TV, not take its place.

CON: If only 5 per cent of the families who now watch "The Ed Sullivan Show" would pay fifty cents each to see it, they would spend $375,000—or two and a half times what the sponsor now pays to bring it to the public free. The other 95 per cent who did not pay fifty cents would not see the program at all. Inevitably, the best of free TV would switch to pay TV; free TV would deteriorate; your investment in your TV set would be less productive.

This is not the entire argument, by any means, but it's the basic disagreement. It's what the fight is all about. Only you can decide whether pay TV would be best for you.

Gene Godt
WCCO Radio and TV

CONVENIENCE FOODS

Recently there came to our attention a small brochure entitled "A Case for Convenience Foods." It is strange that we fail so often to recognize how changing times and customs alter and affect our daily living. In this brochure, William B. Murphy, president of the Campbell Soup Company, points out that as early as 1900 his company had become interested in the development of special convenience foods, particularly in the form of condensed soups. As time has gone on, and our mode of living has changed, the convenience foods have increased in number to include a great variety of processed canned foods, as well as frozen foods, designed for a single purpose to entire frozen meals, prepared and ready to heat and serve.

In order to develop such a product, reliance is placed upon extensive research in agriculture. As the agricultural research develops and the products on the farm are now ready for the consumer in the form of convenience foods, it becomes necessary for research and development in new equipment. All this is essential and necessary so that the quality and flavor of the foods shall be universally uniform as well as uniform for all time. Just as in medicine, research and development have made medical progress possible, so here, in a food industry, research and development have now brought to the American consumer a great variety of "convenience foods." All these products better serve the consumers and play an important role in our economic structure.

J.F.B.

EFFECT OF TOBACCO CHEWING ON CIRCULATION

Although the annual consumption of chewing tobacco in the United States is 81 million pounds, practically no information is available about its clinical or physiological effect and specifically its effect on the heart and circulation. Accordingly, habitual male chewers were studied before, during and after chewing both standard commercial (1.53 per cent nicotine) and low nicotine (.31 to .47 per cent tobacco).

Our subjects were twenty-four voluntary habitual male chewers whose ages ranged between thirty-four and seventy-one (average age 51.1). Each subject chewed a full mouthful of low nicotine chewing tobacco (gum was used in several subjects as a placebo) and a regular commercial brand on the alternative day. The average amount of tobacco chewed weighed 10 grams. Observations were made in the basal postabsorptive state following a rest period of at least 45 minutes. The pulse rate was determined from the electrocardiogram, the blood pressure was taken by a standard mercury sphygmomanometer and the skin temperatures were measured in a constant temperature room at 78 degrees F. and 40 per cent relative humidity, with continuous temperature readings from copper-constantin fine thermocouples attached to the forehead and the volar surfaces of the fingers and toes. Ballistocardiograms were recorded with our high frequency table type research instrument. The subjects were supine and unclothed and chewed for twenty minutes.

Conclusion: The chewing of tobacco in an older group of habitual male subjects produces increase in pulse rates, blood pressures and drop in skin temperatures, as well as deterioration of the ballistocardiogram, indicating a rather profound cardiovascular effect.—David L. Simon, M.D., and associates, University of Cincinnati College of Medicine, in paper presented before second annual meeting of the American College of Angiology, Chicago, June 10, 1956.

PLEA FOR WALKING CANE

Doctors should help restore the old walking cane to its former fashionable position, believes Dr. Walter P. Blount of Milwaukee. In a report to the American Academy of Orthopedic Surgeons in Chicago, he said: "The cane has medical value to relieve stress, especially in persons with bone and joint injuries, in residual poliomyelitis resulting in a fatiguing unsightly lurch, and in early degenerative disease of the hip."—W. D. Blount, Medigrams, *GP*, March 13, 1956.

President's Letter

CANCER DETECTION IN THE PHYSICIAN'S OFFICE

Frankly, I cannot understand the reluctance of our Minnesota physicians to participate in the program of cancer detection in their own offices.

I do think some mistakes have been made in the past regarding cancer detection and these mistakes have discouraged many physicians. I believe the first mistake was made several years ago when societies were prevailed upon to set up free cancer detection centers where people could come to have free physical examinations at stated times. Under this system, the doctors of the communities donated their services on a rotation basis. The theory apparently was that many people delayed examination because they could not afford it. But who appeared for examination? Some of your best-paying patients, whom you have been trying to get to have complete work-ups for some time. Most of these had already had routine histories and physical examinations in your offices, but they seemed to think because this was a cancer detection center that physical examinations would be different. Again it was rather silly to see a radiologist, psychiatrist, an eye, ear, nose and throat man or a dermatologist doing rectals and vaginals for detection of cancer. The free detection centers soon faded from the picture and rightly.

Then the University cancer detection center was set up strictly as a research project. Its only purpose was to examine asymptomatic individuals in the cancer age group—people who believed they were perfectly well—in order to see what incidence of asymptomatic cancer could be detected in such a group.

This detection center has been in operation for several years now, and asymptomatic cancer has been found in one of each thirty-eight patients examined, 50 per cent of these found on the first examination and 50 per cent on subsequent examinations.

There are two criticisms to be made of the University cancer detection center, as I see it, and neither is the fault of the center itself.

The first criticism is that the center did not get asymptomatic persons to examine. From my own experience and from the experiences of other physicians with whom I have talked, I am sure that the majority of those reporting to the center were patients who have had multiple symptoms and cancer phobias for several years.

The second criticism, as I see it, is that it has led the people to think they must go to such a center to have early cancer diagnosed. It has created the impression that any community doctor, no matter how well-equipped with x-ray, proctoscopes, vaginal speculum and laboratory facilities, cannot do what they do at the detection center. The fact is that on the basis of tabulated examinations to date, the private practicing physician is finding the same percentage of cancer, including visceral cancers, the same percentage of precancerous lesions, and the same percentage of non-cancerous diseases as are found at the detection center.

This thinking has led to an accumulation of patients applying for admittance to the detection center until there is now a back-log of some 7,000 persons waiting to be examined. The center is becoming a service center instead of a research center. I am afraid these people will continue to wait for their turn at the center until many of them will have, not asymptomatic cancer, but possibly inoperable cancer.

I do not feel that the nominal fee of $25 is of much influence in their decisions to go to the center.

The University cancer detection center is anxious to refer this back-log of people back to their family physicians for examinations. All they ask is that the component medical societies agree to use the forms prescribed for the examination and forward a copy of the examination to the center for statistical purposes. This seems to be the fly in the ointment. Many physicians say they do not believe it is ethical to divulge such information to a third party. Some think it is illegal, that they are violating the confidence of the patient. I see no reason why the forms could not provide a place where the patient could sign his name, thus authorizing you to give the information to the detection center, the same as the patient authorizes a physician or a hospital to give information from their records to an insurance company. If a patient who has a cancer detection work-up refuses to sign for any reason, the physician would not report that case to the center. The patient has still had a cancer detection examination, and that is the important thing. Certainly, those 7,000 people waiting for the center would not refuse to sign, if they were referred back to you from the center.

Our state Cancer Committee has offered what I think is an excellent suggestion:

> "Since the detection center is anxious to obtain asymptomatic cases only, it is suggested that the center require each and every applicant to obtain from his doctor a preliminary medical history before being admitted to the center. This procedure would serve the following purposes:
>
> "1. It would eliminate symptomatic patients from the center.
>
> "2. It would bring the symptomatic patients to the doctor's office for early investigation.
>
> "3. It would afford the asymptomatic patient the opportunity of asking his own physician to perform a cancer detection examination without waiting to be examined at the cancer detection center."

The history required would not be burdensome, would justify an office call charge, and would eliminate the symptomatic patient from the center.

This matter is coming up for consideration at the September meeting of the Council, and I am sure your councilman would be glad to hear from you if you have any sentiments to express regarding the detection of cancer in your local office before that date. Personally, I feel very strongly that it is time we get this service back to the physician's office in his own community.

R. H. Wilson

President, Minnesota State Medical Association

Medical Economics

Edited by the
Committee on Medical Economics,
Minnesota State Medical Association
George Earl, M.D., Chairman

PRESIDENT SIGNS MILITARY DEPENDENTS' MEDICAL CARE BILL

President Eisenhower has signed the Military Dependents Medical Care bill which will provide a system of medical care for the nearly three million dependents of members of the armed services. This bill makes medical care a statutory right. defines dependents and provides uniform benefits for Army, Navy, Air Force, Marine Corps, Coast Guard and Commissioned Corps of Coast and Geodetic Survey and U. S. Public Health Service. This protection for dependents is designed to make military careers more attractive and thus help to reduce personnel turnover.

The act will provide for continuing the practice of providing medical care to dependents and retired personnel at service medical facilities, will permit dependents and retired personnel of all the uniformed services to obtain available medical care at any medical facility of the Army, Navy, Air Force or Public Health Service and will require the establishment of a system of providing medical care through civilian medical facilities for those spouses and children of active duty personnel who do not have access to service medical facilities.

The bill will also provide miscellaneous benefits such as waiver of subsistence charges for all retired enlisted personnel and provides for the hospitalization of dependents in excess of one year in unusual cases.

SENATE AND HOUSE ACTIONS ON MATTERS OF MEDICAL INTEREST

Senate Stalls on 7225

The Senate was still putting off thorough debate on the Social Security bill (7225) early in July. At that date the lineup on payments to the disabled was still so close that physicians were urged to contact their senators to voice their opposition to this disability proposal.

Committee Agrees on Narcotics Bill

A Senate-House conference committee announced agreement late in June on a bill that would permit the death penalty for peddling heroin to minors. It also would stiffen other penalties for narcotics violations.

The measure, a compromise of separate bills passed by the Senate and the House would outlaw heroin in the United States except for research purposes. It would require all heroin now held to be surrendered to the Treasury Department within 120 days.

Besides increasing penalties for the possession and sale of narcotics, the measure would prohibit the use of the telephone, the mails or any other communications to carry on illicit drugs traffic. It also provides additional authority for the issuance of search warrants.

The bill would permit the death penalty to be meted out to persons who sell heroin to minors if this were recommended by a jury. Without such a recommendation, the penalty could be ten years to life imprisonment even for a first offense.

Major Medical Coverage for Federal Employes Still in Doubt

There are opposing camps in the present battle over the type of health insurance the U. S. should provide for its 2.3 million employes and their dependents. Blue Cross, Blue Shield, the American Hospital Association, the Co-operative Health Federation and the International Association of Machinists as well as the AFL-CIO are for contributory, basic coverage. The Civil Service Commission, the Department of HEW and a number of Federal employes' unions are for major medical benefits along the lines of H.R. 11630 on which the House Civil Service Committee is holding public hearings at the present time.

AMA and AHA Testify on Civil Defense Problems

The American Medical Association and the American Hospital Association recently presented testimony on civil defense matters at a hearing conducted by the military operations subcommittee of the House Committee on Government Operations. Dr. Harold C. Lueth and Frank Barton of the AMA Council on National Defense said a practical medical defense program still remains to be achieved. Dr. Lueth said it is time to begin considering organization of full and part-time personnel rather than relying on volunteers.

National Medical Library Site Discussed

The House Administration Committee has heard from backers of a plan to place the proposed National Library of Medicine in Chicago.

The Senate has passed the bill converting the Armed Forces Medical Library into a National Library of Medicine and authorizing the appropriation of sufficient funds to erect a new building. This library would be part of the Public Health Service with a Board of Regents to be appointed by the President.

Omnibus Bill Moves Ahead

The five-part S. 3958 was approved by the House Commerce Health subcommittee recently. The five proposals would provide advanced training to public health personnel, would train more nurses for teaching and supervisory positions, would earmark $5 million a year for practical nurse training, would extend the hospital construction program for two years and would authorize a new program of Federal grants in the field of mental health.

Sickness Survey Bill Passed

The House passed the sickness survey bill (S. 3076) and Senate concurrence in minor changes made in the House Commerce Committee was anticipated. The White House is asking $780,000 to get the survey underway. The Public Health Service is already developing plans for a twenty-member Washington staff and personnel for field duty.

Senate Passes Bill to Aid Mentally-Retarded Children

The Senate has passed S. 3620 designed to encourage expansion of teaching and research in the education of mentally retarded children through grants to institutions of higher learning and to State educational agencies.

Water Pollution Bill Passes Both Houses

Both branches of Congress have passed water pollution control legislation. In many respects the House and Senate versions are similar in authorizing continued Federal-State co-operation in the development of comprehensive programs for the control of pollution. Such legislation would also increase and broaden technical assistance to States, expand use of grants by State and interstate agencies for water pollution control work and other measures for improved water pollution control.

Loan Rules for Nursing Homes, Hospitals Fixed

The Small Business Administration, a Federal agency, is now ready to make loans to proprietary nursing homes, hospitals and "similar privately-owned health facilities." Medical and dental laboratories will be eligible for government loan assistance provided they are operated for profit like the hospitals and nursing homes.

CONFERENCE ON AGING

Almost 250 top state and federal officials most concerned with the problems of older people participated in the Federal-State Conference on Aging held in Washington in June. The participants outlined goals for improving services in the field of aging and made specific recommendations with respect to Federal and State responsibilities, organization as well as practical techniques.

The nearly fifty recommendations fell under the following broad areas of subject matter: employment, vocational rehabilitation and retirement; income maintenance; physical and mental health; education and recreation; housing and living arrangements and organization and functions in the states.

COMBATTING MALPRACTICE ACTIONS

J. Joseph Herbert, chief legal counsel for the Michigan State Medical Society, has suggested several steps a physician may take to protect himself from the moment any patient indicates dissatisfaction:

1. If the patient hints he thinks something was wrong, treat him with polite but noncommittal formality. Above all don't gratuitously assume the blame for a bad result. Speak in carefully chosen phrases.
2. At the first hint of a malpractice claim, notify your insurance company. Don't wait until the word "lawsuit" is mentioned.
3. If suit seems possible, immediately review your office records and any relevant hospital records.
4. Always be completely frank with your own lawyer and with your insurance company's lawyers.
5. If you suspect a suit is brewing, seek out your own colleagues for advice and help.

MEDICAL STUDENTS' INCOME SOURCES LISTED

The most important sources of medical students' income in 1955-56 were vacation earnings, personal earnings of the student during the year, earnings of the student's wife, gifts from parents and the G.I. bill, according to figures from the Association of American Medical Colleges. The largest average amount of income was wives' earnings.

Last year the largest group of medical students (33 per cent) came from families in which the father was a laborer or in lower levels of business. Only 10 per cent were children of physicians while 25 per cent were children of executives or men in managerial positions and 16 per cent children of persons in professions other than medicine. The fathers of 16 per cent were deceased, retired or unemployed.

MEDICAL COSTS NOT HIGHLY CRITICIZED

Medical costs in general come in for less criticism than other living costs, according to a report on a national survey of opinions released by the Health Information Foundation. Only 26 per cent of the adult population believes that the cost of medical care is much too high while 40 per cent thinks food prices are out of reason.

MEDICAL SURVEYS OF INTEREST

The Physician's Vacation Habits

According to a recent survey, nearly 10 per cent of U. S. physicians in independent practice work fifty-two weeks a year. Others took two or more vacations during 1955. Favorite months for vacationing rank in this order: August, July, June, September, October. Most drive in their own cars to vacation spots; more than 30 per cent favor seashore vacations and states that drew the majority of travelers were Florida, New England and the Rocky Mountain area.

Fishing is the most popular diversion followed by sightseeing, swimming and golf.

Almost half of the doctors surveyed reported that they try to travel without disclosing the fact that they are physicians, but they seldom succeed. A general practitioner from Connecticut, for example, visited a medical friend in Florida last year and was prevailed upon to cover for him while he attended a three-day medical convention.

Most Physicians Over Sixty-Five Still in Practice

A questionnaire sent to physicians over sixty-five, the conventional age of retirement, reveals that: (1) eight of every ten are still in active practice; (2) one of every two sees more than forty patients in an average week; (3) one of every four treats patients of all ages; one of every two sees chiefly patients between forty and sixty; (4) one of every four will handle all types of cases; three of every four do not accept surgical cases.

More Registered Nurses in Medical Offices

In the past ten years there has been a 500 per cent increase in the number of registered nurses working in medical offices. The total now stands at 35,200.

Marriage and Divorce Among Physicians

A study of a large group of American physicians shows that 95 per cent are married (one-third of them to nurses) and 90 per cent are married to their original wives. The U. S. divorce rate is 19.6 per cent but only 6 per cent of the doctors have been divorced and most of these have remarried. Fewer than 14 per cent are childless; the typical doctor is a father of three.

Survey on Ambulance Licensing Laws

The Tennessee State Medical Association conducted a survey on ambulance licensing laws and concluded that such laws are gravely inadequate in forty-five states. Only three states require first aid training for ambulance personnel and only two states require ambulances to even carry first-aid equipment.

NEW GRANTS FOR VITAMIN, NUTRITION RESEARCH

Twelve new grants, for a total of $84,295.20 to American universities throughout the country, will augment the extensive program of clinical and laboratory research in the fields of vitamins and nutrition of the National Vitamin Foundation, Inc. The new grants became effective July 1.

ACTIVITIES OF THE SEARS, ROEBUCK FOUNDATION

(Continued from Page 535)

Addresses to which application should be sent:

Pacific Coast: 2650 Olympia Boulevard, Los Angeles 54, California.

Southwestern: 1409 South Lamar Street, Dallas 2, Texas.

Midwest: 8 Congress Street, Chicago 5, Illinois.

South: 675 Ponce de Leon Avenue, Atlanta, Georgia.

East: 4640 Roosevelt Boulevard, Philadelphia 32, Pennsylvania.

American Medical Association

PROCEEDINGS OF THE HOUSE OF DELEGATES

June 11-15, 1956—Chicago, Illinois

Hospital accreditation, evaluation of graduates of foreign medical schools, private practice by medical school faculty members, federal aid to medical education and premature publicity on new drugs were among the major subjects acted upon by the House of Delegates at the American Medical Association's 105th Annual Meeting held June 11-15, 1956, in Chicago.

Dr. David B. Allman, surgeon of Atlantic City, N. J., was named unanimously as president-elect for the coming year. A member of the AMA Board of Trustees since 1951 and also chairman of the Committee on Legislation, Dr. Allman will become president of the American Medical Association at the June, 1957, meeting in New York City. He will succeed Dr. Dwight H. Murray of Napa, Calif., who took office at the Tuesday evening inaugural program in the Chicago Civic Opera House.

The House of Delegates selected Dr. Walter L. Bierring of Des Moines, Iowa, as recipient of the 1956 Distinguished Service Award of the American Medical Association for his long and outstanding contributions to medicine and humanity. Dr. Bierring, a past president of the AMA, was honored for his achievements in the fields of public health and medical examining board work. He formally accepted the award at the Tuesday inaugural program.

Total registration at the end of the fourth day of the meeting was 22,394, including 9,793 practicing physicians and 12,601 residents, interns, medical students and guests.

Hospital Accreditation

The House of Delegates approved the report of the Committee to Review the Functions of the Joint Commission on Accreditation of Hospitals, which was appointed by the Speaker as a result of action taken at the June, 1955, meeting. The Committee came to the following conclusions:

1. Accreditation of hospitals should be continued.
2. The Joint Commission should maintain its present organizational representation.
3. The Board of Trustees should report annually to the House of Delegates on the activities of the Joint Commission.
4. Physicians should be on the administrative bodies of hospitals.
5. General practice sections in hospitals should be encouraged.
6. Staff meetings required by the Joint Commission are acceptable, but attendance requirements should be set up locally and not by the Commission.
7. The Joint Commission should not concern itself with the number of hospital staffs to which a physician may belong.
8. The Joint Commission is not and should not be punitive.
9. The Joint Commission should publicize the method of appeal to hospitals that fail to receive accreditation.
10. Reports on surveys should be sent to both administrator and chief of staff of hospital.
11. Surveyors should be directly employed and supervised by the Joint Commission.
12. Surveyors should work with both administrator and staff.
13. New surveyors should receive better indoctrination.
14. Blue Cross and other associations should be requested not to suspend full benefits to non-accredited hospitals until those so requesting have been inspected.
15. The American Medical Association should conduct an educational campaign for doctors relative to the functions and operations of the Joint Commission.
16. The Committee also suggests that the American Medical Association and the American Hospital Association encourage educational meetings for hospital boards of trustees and administrators either on state or national levels to acquaint these bodies with the functions of accreditation.
17. This Committee asks to be discharged upon submission of this report to the House of Delegates.

The House also approved a reference committee suggestion that the following statement be added to strengthen the report:

The Committee recommends that the commissioners to the Joint Commission on Accreditation of Hospitals, appointed by the Board of Trustees of the American Medical Association, urge that Commission to study:

1. The problems of the exclusion from hospitals and arbitrary limitation of the hospital privileges of the general practitioner, and
2. Methods whereby the following stated principles may be achieved:

The privileges of each member of the medical staff shall be determined on the basis of professional qualifications and demonstrated ability.

Personnel of each service or department shall be qualified by training and demonstrated competence and shall be granted privileges commensurate with their individual abilities.

Graduates of Foreign Medical Schools

The House of Delegates approved in principle a program for the evaluation of graduates of foreign medical schools seeking hospital positions in the United States. The proposed program was developed by the Co-operating Committee on Graduates of Foreign Medical Schools, representing the AMA Council on Medical Education and Hospitals, American Hospital Association, Association of American Medical Colleges and Federation of State Medical Boards of the United States.

The following principles were emphasized by the Council on Medical Education and Hospitals in its report recommending AMA participation in the program:

1. Although the responsibility to share education opportunities in medicine is recognized, the primary concern must be for the health care of the American public. Thus. before assuming responsibility for the care of patients as interns or residents, all graduates of foreign medical schools (immigrants, exchange students and American graduates of foreign medical schools) should give evidence, as nearly as can be measured, of having reached a level of educational attainment comparable to that of students in American schools at the time of graduation.

2. The primary objective of this Committee is to devise an effective mechanism for measuring educational attainment in the absence of intimate and continuing knowledge of the educational background of foreign-trained physicians. This mechanism should provide hospitals with pertinent information regarding the medical qualifications of foreign-trained physicians seeking positions as interns or residents. It should not interfere with the hospital's privilege of making its own selection among qualified physicians, nor should it serve as a substitute for or interfere with the normal licensure procedures of the various state boards.

3. It is not intended that this mechanism be applicable to those foreign medical school graduates in this country as temporary students participating in programs of medical and related studies in recognized universities, medical schools and postgraduate schools, who by the very nature of their study are not involved in the responsibility of patient care.

The proposed plan calls for establishment of a central administrative organization to evaluate the medical credentials of foreign trained physicians desiring to serve as interns or residents in American hospitals. Basic requirements would include satisfactory evidence of at least 18 years of total formal education including a minimum of 32 months in medicine exclusive of any time which in this country would be considered as premedical study or internship. Applicants with satisfactory credentials would take a screening examination to determine their medical knowledge and their facility with the English language. Successful applicants then would be certified to hospitals and other interested organizations, with the approval of the foreign-trained physician concerned.

Private Practice by Medical School Faculty Members

Another major action by the House involved the problem of private practice by medical school faculty members, which has been under study by the Committee on Medical and Related Facilities of the Council on Medical Service. The House adopted a Council report which stated:

> "It shall be the policy of the American Medical Association that funds received from the private practice of medicine by salaried members of the clinical faculty of the medical school or hospital should not accrue to the general budget of the institution and that the initial disposition of fees for medical service from paying patients should be under the direct control of the doctor or doctors rendering the service."

It was further recommended that adequate liaison be developed and maintained between each county medical society and any medical school or schools in its area; that the Council on Medical Education and Hospitals and the Association of American Medical Colleges urge all medical schools to assist and work with medical societies in developing such liaison, and that publicity emanating from a medical school should be in good taste and of a type which has the approval of the general medical community in that area.

The adopted report also said:

> "It is not in the public or professional interest for a third party to derive a profit from payment received for medical services, nor is it in the public or professional interest for a third party to intervene in the physician-patient relationship."

Federal Aid to Medical Schools

One of the most controversial subjects of debate on the floor of the House was a resolution expressing strong opposition to S. 1323, a bill in Congress providing for one-time, matching grants to medical schools for construction purposes. The Association in recent years has been supporting such legislation in principle, with certain reservations concerning details of some provisions. The House reaffirmed that policy by approving a reference committee statement which said:

> "We appreciate the intent with which this resolution was introduced, but at the same time we feel that there are many economic and geographical factors involved, which might not make this resolution practical on a national level. Inasmuch as no evidence was offered to this Committee to justify a change in the previously declared policy of the House of Delegates, your Committee recommends that this resolution be not adopted."

Premature Drug Publicity

The House adopted a substitute resolution which read:

> "Whereas, In recent years, events have indicated the necessity for a closer liaison between the pharmaceutical manufacturer and the American Medical Association; and
>
> "Whereas, In view of the tremendous number of new drugs being developed and the expanding research programs in medical colleges, clinics and hospitals being financed by the drug industry, it is imperative that the manufacturer and the medical profession develop cooperatively guiding principles which will protect the American people from being subjected to the premature release of information pertaining to new products or techniques; and
>
> "Whereas, Competition within the pharmaceutical industry has become extremely keen so that in the advertising of their products drug manufacturing firms have been forced into the expenditure of larger and larger sums of money and in increasingly broader fields of advertising; therefore be it
>
> "Resolved, That the Board of Trustees of the American Medical Association appoint a liaison committee to meet with representatives of the pharmaceutical manufacturers to accomplish this objective."

Miscellaneous Actions

Among many other actions on a wide variety of subjects, the House also:

Approved a Board of Trustees statement on Social Security which included the following: "It is imperative that we distinguish clearly between this problem of coverage of physicians and the far more dangerous disability proposal. The fact should be recognized that the shape of medical practice in the future is not directly related to the inclusion or exclusion of physicians under OASI. It is a matter of vital importance to us as individuals, but it cannot, per se, stimulate further government intrusion into medical care. On the other hand, the disability amendment obviously brings the Social Security Administration closer to the regulation of medical care than ever before."

Adopted a resolution amending the By-laws to provide that the Vice President, Treasurer, Speaker and Vice Speaker of the House of Delegates shall be ex-officio members of the Board of Trustees with all the rights and duties of the Board without the right to vote.

Increased membership of the Council on Medical Service from six to nine active or service members and eliminated all ex officio members except the immediate Past President.

Directed the Council on Medical Service and the Council on Industrial Health to reconsider the "Guiding Principles for Evaluating Management and Union Health Centers" through their Joint Committee on Medical Care for Industrial Workers and to so revise the guides that they conform completely with the Principles of Medical Ethics.

Authorized the Committee on Federal Medical Services to make a continuing study of all aspects of VA medical activities under the basic policy established in June, 1953, and suggested reconsideration of the temporary exceptions made at that time with respect to neuropsychiatric and tuberculous disorders.

Recommended that the Board of Trustees select New York City as the place of the 1961 annual meeting.

Opening Session

At the Monday opening session, Dr. Elmer Hess, outgoing AMA President, warned that the medical profession must be prepared to face an all-out drive by some labor groups for national compulsory health insurance. Dr. Dwight H. Murray, then President-Elect, told the House that general practitioners and specialists must guard against "any cleavage within our profession," and he urged strength through unity.

Dr. Lowell T. Coggeshall, special assistant to Secretary Marion B. Folsom of the U. S. Department of Health, Education and Welfare, assured the House that the over-all medical objectives of HEW are in accord with those of the AMA. A memorial plaque honoring the late Carl M. Peterson, secretary for 17 years of the AMA Council on Industrial Health, was presented by Dr. Ross McIntire on behalf of the President's Committee on Employment of the Physically Handicapped. The Illinois State Medical Society presented a check for $164,940 to the American Medical Education Foundation.

Inaugural Program

Dr. Murray, in his inaugural address at the Tuesday evening ceremony in the Chicago Civic Opera House, declared that "what we need most in medicine today is to find some way of combining modern scientific methods with the personal, friendly touch of the old-time family doctor." The inaugural program, which included the Bluejacket Choir of the U. S. Naval Training Center at Great Lakes, Ill., was telecast over Station WBKB in Chicago.

Election of Officers

In addition to Dr. Allman, the new President-elect, the following officers were elected:

Dr. F. S. Crockett of Lafayette, Ind., Vice President; Dr. George F. Lull of Chicago, Secretary; Dr. J. J. Moore of Chicago, Treasurer; Dr. E. Vincent Askey, of Los Angeles, Speaker, and Dr. Louis Orr, of Orlando, Fla., Vice Speaker.

Dr. Julian Price of Florence, S. C., was re-elected to the Board of Trustees, and Dr. Hugh Hussey of Washington, D. C., was named to succeed Dr. Allman. Dr. Robertson Ward of San Francisco, was elected to the Judicial Council to succeed Dr. Walter F. Donaldson.

Re-elected to the Council on Medical Education and Hospitals were Dr. Guy A. Caldwell of New Orleans and Dr. John W. Cline of San Francisco. Dr. Walter E. Vest of Huntington, W. Va., was named to succeed Dr. Louis A. Buie on the Council on Constitution and By-laws.

Elected to the Council on Medical Service were Dr. Carlton Wertz of Buffalo, N. Y., to succeed himself, and Dr. J. F. Burton of Oklahoma City to succeed the late Dr. A. C. Scott, Jr., of Texas. Named for the three new places created on the Council on Medical Service were Dr. Thomas Danaher of Torrington, Conn.; Dr. R. M. McKeown of Coos Bay, Ore., and Dr. Lafe Ludwig of Los Angeles.

J. Arnold Bargen, M.D., Rochester
O. J. Campbell, M.D., Minneapolis
George Earl, M.D., Saint Paul
F. J. Elias, M.D., Duluth
Delegates to the American Medical Association.

In Memoriam

ARTHUR V. GARLOCK

Dr. Arthur V. Garlock, prominent Bemidji physician and former mayor of his community, died June 24, 1956. He was seventy-one years old.

A graduate of Northwestern University Medical School, he took postgraduate work at the Medical Research Study Club, Los Angeles, and at George Washington University, Washington, D. C.

Dr. Garlock had practiced medicine in Bemidji since 1914; he served as mayor in 1921 and 1922. An eye, ear, nose and throat specialist, he was on the staff of the Lutheran Hospital of Bemidji.

Dr. Garlock was a member of the Upper Mississippi Medical Society, the Minnesota State Medical Association and the American Medical Association.

He is survived by his wife, Mabel, one daughter, and one son.

Meetings and Announcements

MEDICAL MEETINGS

STATE

Minnesota Society of Obstetrics and Gynecology, fall meeting, Rochester, Minnesota, September 22. Dr. Edward A. Banner, secretary, Rochester, Minnesota.

Northern Minnesota Medical Association, annual meeting, Alexandria, September 7 and 8.

Southern Minnesota Medical Association, annual meeting, New Ulm, September 10.

NATIONAL

American Association of Blood Banks, ninth annual meeting, Somerset Hotel, Boston, Massachusetts, September 3-5. Secretary Marjorie Saunders, 725 Doctors Building, 3707 Gaston Ave., Dallas, Texas.

American Heart Association, 29th annual scientific session, Cincinnati, Ohio, October 26-29. Write American Heart Association, 44 East 23rd Street, New York 10, New York.

Diseases of the Chest, 11th annual postgraduate course, Hotel Knickerbocker, Chicago, Illinois, October 15-19.

Diseases of the Chest, ninth annual postgraduate course, Park-Sheraton Hotel, New York, New York, November 12-16.

Centennial Exposition, 100th anniversary of the Academy of Medicine of Cincinnati, Music Hall, Cincinnati, Ohio, February 27-March 5, 1957.

Minnesota-Dakota-Manitoba Orthopedic Society, annual meeting, Red Wing, Minnesota, September 7 and 8. Dr. Hollis Ahlrin, secretary, Rapid City, South Dakota.

National Society for Crippled Children and Adults, annual convention, Hotel Statler, Washington, D. C., October 28-31.

Postgraduate Medical School of New York University—Bellevue Medical Center, eight-week course in occupational medicine, September 10-November 2. Write Dean, N.Y.U. Postgraduate Medical School, New York 16, New York.

University of Illinois Department of Otolaryngology, Annual Assembly in Otolaryngology, October 1-7. Write Department of Otolaryngology, 1853 West Polk Street, Chicago 12, Illinois.

INTERNATIONAL

European Congress of Cardiology, Stockholm, Sweden, September 10-14. Dr. Karl E. Grewin, secretary, Sodersjukhuset, Stockholm, Sweden.

Inter-American Congress of Cardiology, Havana, Cuba, November 4-10. Dr. Ramon Aixala, Apartado 2108, Havana, Cuba.

Inter-American Conference on Occupational Medicine and Toxicology, Miami, Florida, September 3-7. Sponsored by the schools of medicine of University of Miami and University of Havana, Cuba. General chairman, Dr. Homer F. Marsh, dean, School of Medicine, University of Miami.

International Cancer Cytology Congress, Chicago, Illinois, October 9-11.

International College of Surgeons, 21st annual congress, United States and Canadian sections, Palmer House, Chicago, Illinois, September 9-13.

International Congress of Clinical Chemistry, Hotel New Yorker, New York, September 9-14. Secretary, John G. Reinhold, 711 Maloney Building, University of Pennsylvania, Philadelphia 4, Pennsylvania.

International Congress of Internal Medicine, Madrid, Spain, September 19-23. Dr. J. C. DeOya, secretary, No. 90, Madrid, Spain.

International Congress of International College of Surgeons, Palmer House, Chicago, Illinois, September 9-13. Dr. Max Thorek, secretary general, 1516 Lake Shore Drive, Chicago, Illinois.

Pan American Congress on Cancer Cytology, Miami, Florida, January 8-12, 1957. Dr. J. Ernest Ayre, chairman, 1155 N. W. 14th St., Miami, Florida.

Pan-Pacific Surgical Association, seventh congress, Honolulu, Hawaii, November 14-22, 1957. Write Dr. F. J. Pinkerton, director-general of the Pan-Pacific Surgical Association, Room 230, Young Building, Honolulu, Hawaii.

Second World Conference on Medical Education, World Medical Association, Chicago, Illinois, August 30 to September 4, 1959.

World Medical Association, Havana, Cuba, October 9-15. Dr. Louis H. Bauer, secretary general, 345 East 46th St., New York 17, New York.

SPECIAL NOTICE

The dates for the 104th annual meeting of the Minnesota State Medical Association have been changed. The meeting, scheduled for St. Paul, will be held *May 13, 14 and 15, 1957*, instead of May 20, 21, 22 as previously announced.

NORTHERN MINNESOTA MEDICAL ASSOCIATION ANNUAL MEETING

The annual meeting of the Northern Minnesota Medical Association will be held at Alexandria on September 7 and 8. Registration will be at the Alexandria Clinic. Discussion periods will follow each of the papers presented. The program for the meeting is as follows:

Friday, September 7

Morning, starting at 10:00 a.m.

"A Plan for the Routine Study of Infertile Couples"—Dr. H. D. Clapp, Crookston.

"When, Where and What to Biopsy"—Dr. A. C. Aufderheide, Duluth.

"The Tranquilizing Drugs"—Dr. Raymond N. Bieter, Minneapolis.

"Diagnosis and Management of Solitary Circumscribed Lesions of the Lung"—Dr. C. H. Hodgson, Rochester.

Business meeting at end of morning session.

Afternoon

"What Should Be Done with the Patient with a Non-toxic Adenomatous Goiter?"—Dr. O. J. Campbell, Minneapolis.

"Diarrhea in Infants and Children"—Dr. T. E. Reichelderfer, Minneapolis.

"Panel Discussion on Anemias—(Diagnosis) Dr. J. B. Moyer, Duluth; (Treatment) Dr. R. N. Bieter, Minneapolis.

Evening

Annual Banquet. Speaker: Dr. Corrin H. Hodgson—"Africa, A Changing Continent."

Saturday, September 8

Morning

Clinico-Roentgen-Pathological Conference. Conducted by Dr. H. G. Moehring, Duluth.

SOUTHERN MINNESOTA MEDICAL ASSOCIATION ANNUAL MEETING

The annual meeting of the Southern Minnesota Medical Association will be held at Turner Hall, New Ulm, on September 10. The morning session will begin at 9:30 a.m. The program is as follows:

Morning

"Case Report: Obstetric Hemorrhage into the Broad Ligament"—Dr. Cornelius A. Saffert, New Ulm.

"The Retarded Child: Diagnosis and Treatment"—Dr. W. S. Chalgren, Mankato.

"The Degenerative Low Back Syndrome"—Dr. Donald R. Lannin, St. Paul.

"Hypnotic Treatment of Neurodermatitis in Twenty Cases"—Dr. Otto B. Fesenmaier, New Ulm.

"Current Advances in Antibiotic Therapy"—Dr. J. E. Geraci, Rochester.

"Excision of Lower Cervical Lymph Nodes: Its Role in Diagnosis"—Dr. O. H. Beahrs, Rochester.

"Case Report: Afibrinogenemia, with Brief Review of Literature"—Dr. George R. McNear, Jr., Mankato.

Afternoon

"Extra-thyroidal Hypermetabolism Associated with Pheochromocytoma"—Dr. D. A. Scholz, Rochester.

"Subdural Empyema of the Brain: Diagnosis and Treatment"—Dr. Alfred Uihlein, Rochester.

"Office Diagnosis and Treatment of Sinusitis"—Dr. John C. Lillie, Rochester.

"The Management of Aneurysms of the Thoracic and Abdominal Aorta"—Dr. J. W. Kirklin, Rochester.

"Impending Occlusion of Central Retinal Vein and Its Treatment"—Dr. Vernon L. Lindberg, Minneapolis.

"Chorioepithelioma"—Dr. Harry B. Neel, Albert Lea.

"Newer Concepts in the Treatment of Ulcerative Colitis"—Dr. Loren E. Nelson, St. Paul.

"Use of Intramedullary Nails in the Treatment of Pathologic Bone Conditions"—Dr. E. W. Johnson, Jr., Rochester.

"Obstructive Uropathies in Children"—Dr. Bruce Linderholm, Minneapolis.

Dr. W. H. Halloran, Jackson, is president of the Southern Minnesota Medical Association; Dr. C. F. Stroebel, Rochester, is first vice president; Dr. Leo R. Prins, Albert Lea, second vice president, and Dr. G. R. Diessner, Rochester, secretary-treasurer.

The four officers plus Dr. David P. Anderson, Austin, make up the executive committee. Other association committees are:

Program: Dr. C. F. Stroebel, Dr. William S. Chalgren, Mankato, and Dr. Edward J. Richardson, St. Paul. *Nominations:* Dr. David P. Anderson, Dr. W. A. Merritt, Rochester, and Dr. Leonard M. Ellertson, Albert Lea. *New Members:* Dr. Otto B. Fesenmaier, New Ulm, and Dr. E. T. Maitland, Jackson. Necrology: Dr. Stanley T. Kucera, Northfield, and Dr. Paul C. Leck, Austin; *Resolutions:* Dr. E. W. Johnson, Jr., Rochester Dr. Charles G. Sheppard, Hutchinson, and Dr. J. A. Cosgriff, Olivia. *Gifts and Awards:* Dr. Leo R. Prins, Dr. W. E. Wellman, Rochester, Dr. Lewis I. Younger, Winona, and Dr. Edwin A. Kilbride, Worthington. *Local Arrangements:* Dr. Fred H. Dubbe, Dr. Albert Fritsche, Dr. Otto J. Seifert, Dr. Milton Kaiser and Dr. Otto B. Fesenmaier, all of New Ulm.

MINNESOTA ACADEMY OF GENERAL PRACTICE

The Minnesota Academy of General Practice announces the Sixth Annual Fall Refresher, to be held at the Prom Ballroom, St. Paul, Minnesota, Wednesday, October 17, 8:30 a.m. to 5:30 p.m. Fourteen lecturers will cover a variety of subjects, and the luncheon speaker will be Dr. Claude J. Beck, Cleveland, Ohio. Also speaking will be Dr. Micheal J. Wohl, Philadelphia, Pennsylvania, and Dr. James L. Dennis, Oakland, California.

Registration fee including the luncheon is $10.00 and inquiries should be addressed to Dr. James A. Blake, 15 Ninth Avenue South, Hopkins, Minnesota.

CONTINUATION COURSES

Medical continuation courses to be presented at the Center for Continuation Study, University of Minnesota, are as follows:

September 25-27	Pediatrics for Pediatricians
October 18-20	Techniques in General Practice
October 22-24	Gynecology for General Physicians
November 5-9	Radiation Therapy for Radiologists
November 19-21	Fractures for General Physicians

For further information concerning the above courses, write to the Director, Department of Continuation Medical Education, 1342 Mayo Memorial, University of Minnesota, Minneapolis 14, Minnesota.

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY EXAMINATIONS

Applications for certification for the 1957 Part I examinations for the American Board of Obstetrics and Gynecology are now being accepted. For further information write Dr. Robert L. Faulkner, Secretary, 2105 Adelbert Road, Cleveland 6, Ohio.

AMERICAN COLLEGE OF GASTROENTEROLOGY COURSE

The annual course in postgraduate gastroenterology, sponsored by the American College of Gastroenterology, will be presented at The Roosevelt, New York, New York, on October 18-20. The course will be under the direction and co-chairmanship of Dr. Owen H. Wangensteen, professor of surgery at the University of Minnesota Medical School. Dr. I. Snapper, director of medical education, Beth-El Hospital, Brooklyn, New York, will be medical co-ordinator for the course.

For further information write the American College of Gastroenterology, Department P.G., 33 West 60th Street, New York 23, New York.

POSTGRADUATE COURSES AT NEW YORK UNIVERSITY

Twenty-six courses in postgraduate medicine are being offered by the Postgraduate Medical School of New York University during the month of October. They are part of nearly 200 such courses available at the school during the coming academic year. Further information can be obtained from the Dean, New York Postgraduate Medical School, 550 First Avenue, New York 16, New York.

AMERICAN GOITER ASSOCIATION AWARD

The American Goiter Association again offers the Van Meter Prize Award of $300 and two honorable mentions for the best essays submitted concerning original work on problems related to the thyroid gland. The award will be made at the annual meeting of the association, which will be held in the Hotel Statler, New York, New York, May 28, 29 and 30, 1957.

Competing essays may cover either clinical or research investigations, should not exceed 3,000 words in length and must be presented in English. Duplicate typewritten copies, double spaced, should be sent to the Secretary, Dr. John C. McClintock, 149½ Washington Avenue, Albany 10, New York, not later than January 15, 1957.

FOUNDATION FUND PROVIDES OPPORTUNITIES FOR PHYSICIANS AND COMMUNITIES

Graduating interns and established physicians are reminded of a unique opportunity to establish themselves in private practice in rural or suburban communities or to improve existing medical facilities in their communities with financial help from the Sears-Roebuck Foundation Revolving Assistance Fund.

Just one year ago the Foundation, in co-operation with the American Medical Association, made a grant of $125,000 for the establishment of this Revolving Assistance Fund. Its purpose is to loan money to physicians wishing to establish or improve medical facilities in areas where medical care is inadequate. Evaluations of all applications is done by a medical advisory board composed of highly qualified physicians appointed by the trustees of the American Medical Association.

In the short time the fund has been in existence 22 loans have been made affecting 33 physicians in 13 states. Loans range from $3,000 to $25,000 and total loans amount to $179,500. These have gone to general practitioners, specialists, partnerships and medical groups. The sole criterion, in addition to medical proficiency, is the need of the community for medical care.

There is no charge to this fund for the administration of the program. This is met by another Foundation grant.

There are two cut-off dates in processing applications: April 1 and October 1. Applications received before April 1 are decided upon by June 15. Those received before October 1 will be acted upon by December 15. So the Foundation is now accepting applications for the last half of 1956.

This Revolving Assistance Fund has great potential. Its future depends entirely on reaching and informing physicians of its existence and its function—to be of service to the medical profession in the field of medical distribution.

Physicians interested in obtaining further information may write to: Norman H. Davis, Director, Medical Program, Sears-Roebuck Foundation, 3333 Arthington Street, Chicago, Illinois.

In general the chronic degenerative diseases, neurological diseases, sensory disorders, mental disease and severe injuries due to accidents make up the major health problems for the nation as a whole. All age groups are represented among those afflicted by these conditions whose one common characteristic is prolonged duration. Care of the "long-term patient" is, in fact, the chief health problem for the physician and the patient's family, for the community, and for the nation as a whole.—L. E. Burney, M.D., *California Medicine*, January, 1956.

Woman's Auxiliary

ANNUAL NATIONAL CONVENTION

The thirty-third annual convention of the Woman's Auxiliary to the American Medical Association was held in Chicago concurrently with the 105th annual meeting of the AMA, June 11-15, at the Conrad-Hilton Hotel.

Delegates from Minnesota were Mesdames Philip Arzt, H. E. Bakkila, Julius Buscher, P. J. Cromwell, D. J. Erickson, R. F. Erickson, H. H. Fesler, Leo Fink, H. C. Habien, O. M. Heiberg, L. P. Howell, F. P. Moersch, C. L. Oppegaard, Peter Rudie, C. L. Sheedy, Charles Waas, R. H. Wilson and F. A. Zinter. This was good representation, with eighteen out of the twenty-three delegates our membership allows. The total registration was 1,042.

Round table discussions on legislation, organization, newsletters, public relations, *Today's Health* and AMEF were held on Monday. That afternoon, Mrs. Mason Lawson and Mrs. Robert Flanders, president and president-elect, respectively, of the National Auxiliary, were guests of honor at a tea at the Sheraton-Blackstone.

The convention was formally opened Tuesday, June 12, with thirteen Minnesota women responding to roll-call. The convention chairmen, Mrs. Leonard Houda and Mrs. Maurice Hoeltgen, were introduced.

Mrs. Delbert MacGregor, Michigan, read the memorial service. Our Minnesota Auxiliary suffered the loss of six members during the year: Mrs. Robert Bowen, Mrs. Wallace Cole, Mrs. Edwin Knight, Mrs. Logan Leven, Mrs. H. A. Roust, and Mrs. E. Roger Rynda. Reports of the national officers and the state presidents of the western, southern and north central regions were heard. Mrs. H. H. Fesler gave an excellent account of Minnesota's accomplishments.

Leonard Read, president of the Foundation for Economic Education, Inc., spoke at the Tuesday luncheon. His topic was "The Positive Approach to Combatting Socialism," and he made an effective plea for the support of private enterprise, stating his conviction that "American people are running away from their own revolution." Study material on this subject may be obtained from Miss Margaret Wolfe, executive secretary of the Auxiliary, AMA, 535 North Dearborn Street, Chicago 10, Illinois.

Wednesday sessions continued with reports of national chairmen, reports from presidents of the eastern region, round-table discussions on civil defense, program, mental health and nurse recruitment. The luncheon honored Mrs. Lawson and Mrs. Flanders. Mrs. George Turner, Texas, presided. Dr. Dwight Murray, new AMA president, and Dr. Elmer Hess, immediate past president, were guests at the luncheon as were other trustees and officers of the AMA.

Mrs. Mason Lawson presented a check for $89,766.00 to Dr. George Lull, manager of the American Medical Education Foundation. This check represented the contributions raised by state and county auxiliaries for the Foundation. An additional $16,546.00 was raised in the Eighty Dimes campaign in April.

Thursday's meeting included consideration of resolutions, some of which will be debated at our mid-winter board meeting. Election and installation of officers was also held on Thursday. Mrs. Paul C. Craig, Pennsylvania, is the new president-elect.

The post-convention board conference held on Friday, with incoming officers and committee chairmen outlining plans for the year ahead was, for me, the most valuable session of the convention. Dr. Ernest Howard, assistant secretary of the AMA, reported on the AMA business meetings and elections and suggested where and how we could be of service to the profession. Other officers from the AMA spoke on legislation, public relations, rehabilitation, mental health and automobile crash injuries.

Reports from the states showed remarkable unanimity in preference of projects. In order of popularity, they were: *Today's Health,* nurse recruitment, AMEF, mental health, and safety. Legislation, of course, is an ever-present concern.

Delegates were reminded that the national board never insists on participation in an activity, and any county group may originate a project if it is approved by the parent medical society. Duluth's "GEMS," the training school for baby-sitters, was given special attention at the session on program and Mrs. Fesler answered innumerable questions on the project.

Today's Health, recruitment and AMEF will continue as major responsibilities of our organization. Program emphasis will be placed on specific rural and community health problems, rehabilitation, care of the aging, automotive safety, and the importance of having a family physician in every home, including the home of the doctor. The principal work of the Auxiliary in civil defense will be promoting home nursing courses and home preparation in case of disaster.

The survey to determine how much time and money doctors give to community activities will continue in some areas, but physicians want to know what will be done with the data. Many wonder why "good deeds done out of one's good will" should be publicized. This survey was not undertaken in Minnesota.

In the mental health field, there is concern about the 500,000 psychotic children institutionalized in the United States. An effort will be made to determine what is being done in each state for these children. Our Auxiliary could help with this analysis.

The Illinois State Auxiliary and the convention chairmen made excellent arrangements for all meetings and social affairs. The tea, luncheons and the banquet, with Ilka Chase as speaker, were all delightful occasions.

Mrs. L. P. Howell, *President*
Woman's Auxiliary, MSMA

Contributions for this column, including news and activities of State Auxiliary societies and items of interest about members, may be sent to Mrs. A. B. Rosenfield, Woman's Auxiliary Editor, Minnesota Medicine, *2920 Dean Boulevard, Minneapolis, Minnesota.*

General Interest

Dr. Robert L. Parker, Rochester, was elected president of the Minnesota Heart Association at the group's annual meeting in St. Paul on July 10. Elected as vice president was **Dr. Milton M. Hurwitz**, St. Paul. **Dr. Karl Anderson**, Minneapolis, was named secretary of the organization.

* * *

After thirteen years of practice in Cloquet, **Dr. Paul B. Monroe** resigned from the Raiter Hospital staff on July 1. Dr. and Mrs. Monroe plan to spend their winters in Arizona but expect to maintain their residence in Cloquet.

* * *

Dr. J. S. Blumenthal, clinical associate professor of medicine and chief of the allergy clinic at the University of Minnesota, presented a talk on "Management of the Allergic Patient" at the annual meeting of the Medical Technicians of Hennepin County in Minneapolis on June 14.

* * *

Ground-breaking ceremonies for a $1,500,000 wing at the Elizabeth Kenny Institute in Minneapolis were held on July 2. Principal speaker at the ceremonies was **Dr. Frank H. Krusen**, Rochester, chief of physical medicine and rehabilitation at the Mayo Clinic. Completion of the new wing at the institute is scheduled for late 1957.

* * *

Dr. R. L. Constans, Willmar, was elected department surgeon of the Veterans of Foreign Wars of the State of Minnesota at the seventh annual department encampment in St. Cloud on June 23.

* * *

A brief biographical sketch of **Dr. Irvine McQuarrie** was featured in the Town Toppers column of the *Minneapolis Star* on June 22. Dr. McQuarrie, head of the pediatrics department at the University of Minnesota since 1930, retired from the University this year and became director of medical education at Kauikeolani Children's Hospital, Honolulu, Hawaii.

Dr. Lewis I. Younger has been re-elected chief-of-staff of the Winona General Hospital, Winona. Also elected to office were **Dr. C. W. Rogers**, vice chief, and **Dr. L. J. Wilson**, secretary. **Dr. W. O. Finkelnburg** was named chief of surgery; **Dr. Sidney O. Hughes**, chief of medicine; **Dr. John A. Tweedy**, chief of obstetrics, and **Dr. Paul Heise**, pathologist and head of laboratory.

* * *

Dr. Charles W. Mayo returned to Rochester in mid-June following a trip around the world. During the journey, he served as President Eisenhower's representative at the coronation of King Mahendra in Nepal.

* * *

The Interstate Clinic at Red Wing announced that a $500 medical student scholarship has been set up at the University of Minnesota in memory of the late **Dr. R. F. Hedin**, one of the founders of the clinic. The first scholarship will be awarded this year by the Minnesota Medical Foundation, which will select the medical student to receive aid.

* * *

Dr. L. A. Barney, Duluth, retired from active practice on July 1 after forty-six years of practice in Duluth. A graduate of the University of Minnesota Medical School in 1909, Dr. Barney interned at St. Mary's Hospital in Duluth, then began practice with the late **Dr. Samuel Boyer**. Following World War I, he went into practice by himself. Since 1942 he has been taking care of merchant seamen for the federal government.

* * *

Plans to remodel and expand the East Range Clinic in Virginia have been announced. The plans call for construction of a second floor on the present structure, with expanded x-ray and laboratory facilities and additional examining rooms. The clinic's staff totals fifteen physicians, located at Virginia, Eveleth, Biwabik and Aurora. President of the East Range Corporation is **Dr. J. Arnold Malmstrom**, Virginia, with **Dr. F. R. Kotchevar**, Eveleth, vice president; **Dr. David Richter**, Virginia, treasurer, and **Dr. S. C. Blackmore**, Biwabik, secretary.

* * *

Dr. Henry W. Woltmann, Rochester, retired from active practice on July 1 after thirty-seven years on the staff of the Mayo Clinic. Dr. Woltmann was one of the founders of the American Board of Psychiatry and Neurology. He has been president of the Minnesota Society of Neurology and Psychiatry, the General Neuropsychiatric Association, the Association for Research in Nervous and Mental Diseases, and the American Neurological Association.

* * *

Eight new consultants have been added to the staff of the Mayo Clinic, Rochester, and ten physicians have become assistants to the staff. The new consultants are **Dr. John A. Callahan**, **Dr. Daniel C. Connolly**, **Dr. John F. Fairbairn II**, **Dr. David L. Hoffman**, **Dr. George D. Molnar**, **Dr. Edward B. Waldmann**, **Dr. Guy Whitehead** and **Dr. Richard K. Winkelmann**. The new assistants to the staff of the clinic are **Dr. John A. Higgins**, **Dr. Earl R. Ensrud**, **Dr. Robert S. Fontana**, **Dr. Patrick J. Kelly**, **Dr. Harold T. Mankin**, **Dr. Dwight C. McGoon**, **Dr. George W. Morrow, Jr.**, **Dr. Joan M. Waterfall**, **Dr. Richard E. Weeks** and **Dr. John H. Windesheim**.

* * *

Dr. John S. Lundy, Rochester, spoke before the Section of Anesthesiology at the AMA meeting in Chicago, June 11-15. He is chairman of the section. **Dr. Robert L. Faucett**, Mayo Clinic psychiatrist, also spoke at the Chicago meeting.

* * *

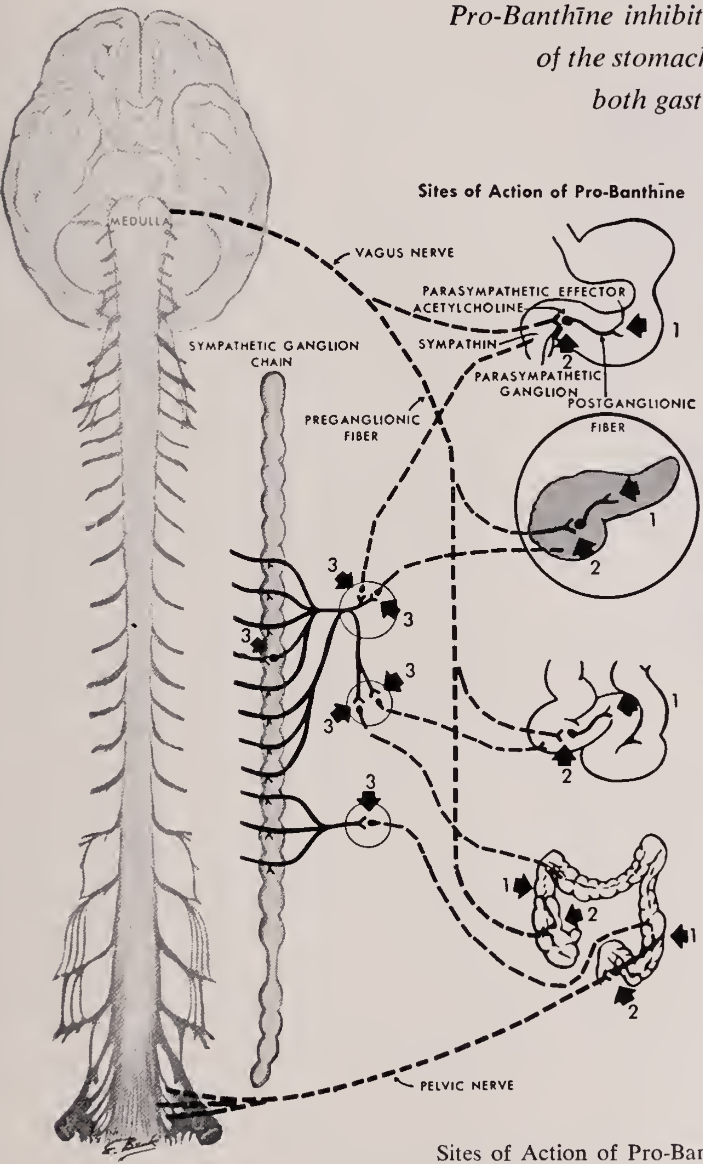
Two scientific exhibits prepared by members of the Mayo Clinic staff were awarded certificates of merit

(Continued on A-34)

PROVED ANTICHOLINERGIC EFFICIENCY

Pro-Banthīne® Provides Rapid Relief in Acute Pancreatitis

Pro-Banthīne inhibits excessive vagal stimulation of the stomach and pancreas and reduces[1,2] *both gastric and pancreatic secretions.*


Sites of Action of Pro-Banthīne
MEDULLA
VAGUS NERVE
PARASYMPATHETIC EFFECTOR
ACETYLCHOLINE
SYMPATHIN
1
2
SYMPATHETIC GANGLION CHAIN
PARASYMPATHETIC GANGLION
POSTGANGLIONIC FIBER
PREGANGLIONIC FIBER
1
2
3
3
3
3
3
3
1
2
3
1
2
1
2
PELVIC NERVE

With use of the Levin tube and a drug "such as Pro-Banthīne . . . most cases of acute pancreatitis[3] will subside in a few hours, or at the most, in a few days."

Schwartz and Hinton achieved[4] dramatic relief of pain in four of six patients with acute hemorrhagic or edematous pancreatitis within twenty to thirty minutes after giving Pro-Banthīne intramuscularly. A dose of 15 to 30 mg. may be repeated[1] parenterally at intervals of six hours.

Pro-Banthīne bromide (brand of propantheline bromide) also has proved highly effective in the therapy of peptic ulcer, hypertrophic gastritis, diverticulitis, biliary dyskinesia, ileostomies and genitourinary spasm. G. D. Searle & Co., Research in the Service of Medicine.

---

1. Jones, C. A.: Arch. Int. Med. *96*:332 (Sept.) 1955.
2. Zollinger, R. M.: Postgrad. Med. *15:* 323 (April) 1954.
3. Woodward, E. R.: M. Clin. North America *38*:115 (Jan.) 1954.
4. Schwartz, I. R., and Hinton, J. W.: Personal communication, February, 1955.

Sites of Action of Pro-Banthīne. *The principal site of action of Pro-Banthīne is on the parasympathetic system where it exerts a dual action while exerting a single and lesser action on the sympathetic system: (1) parasympathetic effector; (2) parasympathetic ganglion; (3) sympathetic ganglion (see arrows).*

SEARLE

a potent germicide

FOR COLD STERILIZATION

Pheneen

AN ULMER PRODUCT

ELIMINATES DOUBTFUL STERILITY IN OFFICE USE . . .

Rapid germicidal activity plus specific sporacidal properties enable Pheneen to provide the extra margin of safety during minor office surgery. Instruments may be stored for months in Pheneen without weekly changes of solution. Special "built-in" rust inhibitor makes this possible. Routine use of colorless, odorless Pheneen reduces questionable sterility to the minimum. For complete information and prices write . . . MM-856.

Physicians & Hospitals Supply Co.

1400 Harmon Place Minneapolis 3, Minn.

(Continued from Page 566)

by the AMA. One, on bone tumors, was prepared by **Dr. David Dahlin, Dr. Ralph Ghormley, Dr. Edward Henderson** and **Dr. Markham Coventry.** A second exhibit, on "Esophageal Motility" was prepared by **Dr. Charles F. Code, Dr. Arthur Olsen, Dr. F. E. Donoghue, Dr. Howard Anderson, Dr. Brian Creamer, Dr. F. Earl Fyke, Jr.,** and **Dr. Arthur H. Bulbulian.**

* * *

A group of doctors from Nationalist China, the Philippines and Korea visited several Minnesota hospitals last month. They stopped at Worthington, Glenwood, Rochester, and the University Hospitals, Minneapolis.

* * *

Dr. B. J. Gallagher, Waseca, was named Waseca County "Father of the Year" by the Waseca Chamber of Commerce.

* * *

Winners of medals at the May Art and Hobby show in Rochester were **Dr. Henry W. Woltman,** Rochester, for his display on rock processing and polishing, and **Dr. William H. Feldman,** Rochester, for his exhibit of portraits of well-known local, national and European physicians. First prize was awarded to **Dr. John Coe,** Minneapolis, for three water-color paintings and second prize went to **Dr. Charles Vandersluis** of Bemidji for a collection of photographs showing the early days of Bemidji prior to 1900.

* * *

Golf tournament winners at the annual meeting in Rochester were **Doctors Philip Olson, Glenn Petersen,** and **J. C. Lindner,** Minneapolis; **Stanford H. Calin, Louis C. Lick, Jr., Bernard G. Lannin, W. W. Amerongen, Louis Lick, Sr.,** St. Paul; **Robert Story,** Little Falls; **John R. Hill, Joseph Pratt, Louis B. Ward, Louis Brunsting, C. A. Good, J. W. Kernohan, Einar W. Johnson, Jr., P. W. Brown,** Rochester; **W. R. Anderson, H. P. VanCleve, Paul C. Leck, R. R. Wright,** Austin; **E. A. Thayer,** Fairmont; **W. B. Wells,** Jackson, and **John Dordal,** Sacred Heart.

* * *

Dr. Herman J. Moersch, Mayo Clinic, was elected president of the American College of Chest Physicians at the 22nd annual meeting of the group June 6-10 in Chicago. The following Minnesota physicians received their certificates of fellowship in the college on June 9:

Dr. Howard A. Anderson, Rochester; **Dr. Earl J. Black,** St. Paul; **Dr. Corrin H. Hodgson,** Rochester; **Dr. Lillian A. Olson,** Ah-Gwah-Ching; **Dr. Lowell W. Weber,** Minneapolis, and **Dr. Wen Yao Yue,** Oak Terrace.

Dr. A. M. Olsen, Rochester, serves as regent of the college for Minnesota, Iowa, Nebraska, North Dakota and Wisconsin.

Dr. Sumner S. Cohen, Oak Terrace, serves as governor of the college for Minnesota.

* * *

Dr. Frederic E. B. Foley, urologist, was honored last month by the surgery staff of Ancker Hospital at a dinner at the Town and Country Club, Saint Paul. Dr.

Foley is chief urologist at Ancker and clinical professor of urology at the University of Minnesota. In 1955, he received the Francis Amory Septennial award from the American Academy of Arts and Sciences.

* * *

Dr. James Bender and **Dr. Werner Anderson**, Brainerd, have been appointed to the medical advisory committee of the Crow Wing County chapter of the National Foundation for Infantile Paralysis.

* * *

Mrs. Ida Lucille Brown Wallace, Cass Lake, medical technologist who has worked in five states and Alaska, was cited as the "most outstanding medical line technologist in the United States" at the recent North American Conference of Medical Laboratory Technologists in Quebec.

Bernice Theissen Elert, medical technologist at Miller Hospital, Saint Paul, was awarded a $50 prize for a paper she presented.

* * *

Frank W. Moudry, Saint Paul pharmacist, was awarded the 1956 Remington honor medal, pharmacy's highest service award. Long-time secretary of the Minnesota State Board of Pharmacy, Mr. Moudry was cited for his "invaluable contributions to pharmaceutical legislation and law enforcement."

NEW LOCATIONS

Dr. Charles W. Zinn, a recent graduate of the University of Minnesota, has become associated with **Dr. A. B. Roehlke** and **Dr. G. H. Tesch** at Elk River. Dr. Zinn replaces **Dr. W. C. Woyda**, who left Elk River on July 1 to begin a residency in surgery at Minneapolis Veterans Hospital.

* * *

Dr. Tauno Ketola, who recently completed a tour of duty in the Air Force, has joined the staff of the Raiter Hospital in Cloquet.

* * *

Dr. Matthew Rimas, formerly of Minneapolis, has taken over the practice of **Dr. O. A. Wisness** at Comfrey. Dr. Wisness began a residency in anesthesia at the University of Minnesota Hospitals in mid-July.

* * *

Dr. Kenneth Larson, a pediatrician formerly with the Children's Hospital in Pittsburgh, Pennsylvania, has become associated with the Oxboro Clinic in Bloomington (Minneapolis suburb).

* * *

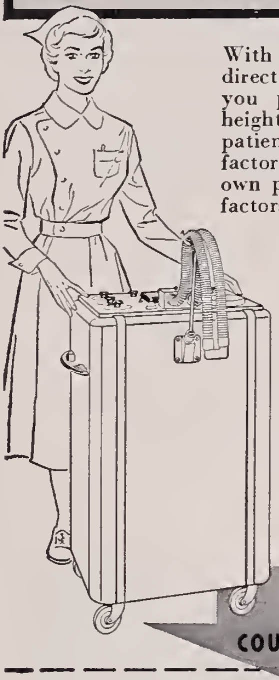
Dr. Manfred Dobler, formerly of Saint Paul, has joined the staff of the Shipman Hospital and Clinic at Ely.

* * *

Dr. Don Kettelkamp, previously of Monona, Iowa, has become a member of the staff of Chippewa Hospital at Cass Lake.

* * *

Dr. Owen W. Holm, a recent graduate of the University of Minnesota, has taken over the practice at the Browerville Clinic, Browerville, replacing **Dr. William J. Byrne**, who moved to California in June.



Wondering . . .

if that BMR test calculation was right?

THERE'S A NEW *surer* WAY . . .

THE L-F BASALMETER

Self-Calculating

Basal Metabolism Apparatus

With this new, self-calculating, direct-reading BMR apparatus, you put in four factors (age, height, weight and sex) and the patient puts in the fifth—the time factor. The BasalMeteR does its own precise timing, computes all factors and gives you, as soon as test is concluded, an accurate basal metabolic rate. NO CHARTS! NO SLIDE RULES! NO OXYGEN TANKS!

No "wondering" about human error with the BasalMeteR. At conclusion of test, you press a button and read the result in terms of a plus or minus in percentage of normal. It's AUTOMATIC! Send for descriptive literature, without obligation, *today!*

MAIL THIS COUPON *today!*

PHYSICIANS and HOSPITALS SUPPLY CO.
Minneapolis 3, Minn.

Gentlemen: Please send me, without obligation, illustrated literature describing the new L-F BasalMeteR.

NAME. . . . .

ADDRESS. . . . .

CITY STATE. . . . .

specify

Lederle

POLIOMYELITIS
IMMUNE GLOBULIN
(human)

For the modification of
measles and the prevention
or attenuation of infectious
hepatitis and poliomyelitis.

LEDERLE LABORATORIES DIVISION
AMERICAN Cyanamid COMPANY
PEARL RIVER, NEW YORK

GLYCAMINE®
TABLETS

For Peptic Ulcers and Hyperacidity

Available All Drug Stores

Distributed by
DALCO PHARMACAL CO.
Minneapolis, Minnesota

THE BANK
WHERE YOU
FEEL AT
HOME

the AMERICAN
NATIONAL BANK OF SAINT PAUL
MEMBER FEDERAL DEPOSIT INSURANCE CORPORATION

MINNESOTA BLUE CROSS-BLUE SHIELD

Since March, 1933, Minnesota Blue Cross has provided 11,984.517 days of hospital care for 1,973,800 subscribers and dependents. Subscriber benefits represented by this care amount to nearly $141,000.000.

Maternity care has always ranked among the major reasons for hospitalization. During the year 1934, Blue Cross paid its first 9 maternity cases. The peak year in number of Minnesota Blue Cross babies occurred during the year 1951 when 25.885 maternity cases were paid. Since 1933, Blue Cross has provided coverage in the births of 277.610 Minnesotans. It is anticipated that the 300,000th Minnesota Blue Cross baby will arrive during the first half of 1957.

In less than nine years of operation, Minnesota Blue Shield has provided benefits for the delivery of over 84,915 new Minnesotans. Since Blue Shield's beginning in 1947 through April 30, 1956, obstetrical benefits totaling $4,773,460 have been paid.

During 1948, the first complete year of operation, Blue Shield paid $9.241 for 185 obstetrical claims. In 1949 Blue Shield babies totaled 1.989, and payments for their deliveries totaled $102,065. The tremendous increase in obstetrical claims paid in 1949 over 1948 was due to increased enrollment and the fact that a greater number of family contracts had fulfilled the then existing 10 month waiting period requirement for obstetrical benefits.

Blue Shield provided benefits for over 6,000 deliveries in 1950 and 10,746 obstetrical claims were paid in 1951. In 1952 and 1953 obstetrical claims paid by Minnesota Blue Shield numbered 13.374 and 14,521, respectively.

After only six years of operation, Minnesota Blue Shield increased the obstetrical allowance under Plan A from $50 to $60 effective January 1, 1954. At the same time the waiting period was reduced from ten months to nine months, and these improvements were made without increasing the subscriber cost of Blue Shield. During 1954, 15.219 obstetrical claims were paid a total of $916.134 as a result of these improvements, and during 1955 the number of Minnesota Blue Shield babies again increased as 16.969 obstetrical claims were paid $1,047.008.

Figures for the first four months of 1956 show that for 5,901 deliveries a total of $365.121 has been paid and at the present rate of incidence an obstetrical allowance for the one hundred thousandth Minnesota Blue Shield baby will be paid early in 1957.

NEW PUBLICATION

A new publication in the heart disease field, *Selected References on Cardiovascular Disease,* has just been issued by the Public Health Service, U. S. Department of Health, Education, and Welfare.

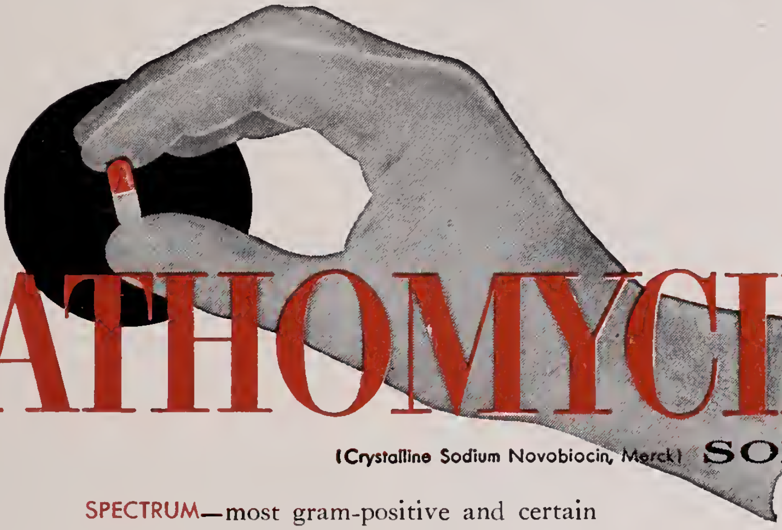
Compiled as a time-saving guide for nurses, this annotated bibliography will also be of use to medical students, nutritionists, health educators, social workers and others in the health field concerned with cardiovascular disease.

Listed as Public Health Service Publication No. 472, this 52-page booklet is available from the Superintendent of Documents, Government Printing Office, Washington 25, D. C., for 25 cents a copy.

NOW AVAILABLE...

a unique new antibiotic of major importance

PROVED EFFECTIVE AGAINST SPECIFIC ORGANISMS
(staphylococci and proteus)
RESISTANT TO ALL OTHER ANTIMICROBIAL AGENTS



'CATHOMYCIN'

(Crystalline Sodium Novobiocin, Merck) **SODIUM**

SPECTRUM—most gram-positive and certain gram-negative pathogens.

ACTION—bactericidal in optimum concentration even to resistant strains.

TOXICITY—generally well tolerated. This is more fully discussed in the package insert.

ABSORPTION—oral administration produces high and easily-maintained blood levels.

INDICATIONS—cellulitis, pyogenic dermatoses, septicemia, bacteremia, pneumonia and enteritis due to *Staphylococcus* and infections involving certain strains of *Proteus vulgaris*, including strains resistant to all other antibiotics.

DOSAGE—four capsules (one gram) initially and then two capsules (500 mg.) twice daily.

SUPPLIED—250 mg. capsules of 'CATHOMYCIN', bottles of 16.

'CATHOMYCIN' *is a trademark of Merck & Co., Inc.*

MSD

MERCK SHARP & DOHME
DIVISION OF MERCK & CO. INC.
PHILADELPHIA 1, PA

Book Reviews

Books listed here become the property of the Ramsey, Hennepin and St. Louis County Medical Libraries when reviewed. Members, however, are urged to write reviews of any or every recent book which may be of interest to physicians.

BELLEVUE IS MY HOME. By Salvatore R. Cutolo, M.D., with Arthur and Barbara Gelb. 317 pages. Price, $4.00. Garden City, New York: Doubleday and Company, Inc., 1956.

Doctor Cutolo is the Deputy Medical Superintendent at New York's Bellevue Hospital and has been attached to this great medical center in one capacity or another for twenty-six years. During this time he has had many exciting experiences which he believes are worthy of publication. Certainly the raw material is there: the *Normandie* fire, the smallpox carrier loose in New York, and the Empire State Building crash, to name a few. But because of poor organization, the interposition of long, disconnected explanatory passages, the recital of apparently limitless details like that of the number of pounds of poultry consumed each month, the lack of any coherence or proper proportioning make the telling of these experiences seem endless, dreary, and confusing.

The greatest sloughing factor to physician-readers will not be found among these weaknesses, however. Instead, the authors' insistence on explaining each medical expression in the simplest possible terms will soon irritate to exasperation, even as will reading the story of "The Three Bears" for the sixth time in an evening. For example, on page 105 he describes the treatment for burns at Bellevue in this manner: "In severe burn cases, the patient usually goes into shock. The condition that brings about shock in a burn case is the loss of protein through the skin. For example, if you burn your finger, you get a bleb. That bleb is full of protein, which you are losing from your body. When the concentration of protein in the circulating blood is suddenly diminished by a loss through this denuded skin, the patient goes into shock. Therefore, one of the routine treatments for such burn cases is the administration of plasma, which is a protein. This is called a substitution treatment; in other words, the patient is losing protein through his skin and we give it to him intravenously . . ." and so on. This is all quite true, but still does not make for an exciting evening of reading for physicians. Of course, it is obvious that the book was not written for physicians, and it will behoove us to observe that intention.

Nevertheless, former Bellevue physicians, and perhaps hospital administrators, may enjoy the book as a gift.

R.C.K.

THE MENNINGER STORY. By Walker Winslow. 350 pages. Illus. Price $5.00. Garden City, N. Y.: Doubleday & Co., Inc., 1956.

"The Menninger Story" is the biography of Charles Frederick Menninger, M.D., otherwise known as Dr. C. F., and the story of the clinic he founded.

Walker Winslow, the author, was assigned by the *Saturday Evening Post* to do an article on the Winter V.A. Hospital then managed by Dr. Karl Menninger. The assignment made him want to learn more about these Menningers and their clinic. Mr. Winslow, who had been actively interested for some time in mental health and who had written his autobiography entitled, "If a Man be Mad," recognized the Menningers as pioneers in the advancement of American psychiatry.

The book begins with the birth of Dr. C. F. in 1862 and shows all the various early influences that shaped his life; and it closes with his death in 1953 after recounting in an interesting and readable manner the story of his education, his marriage, the births of his now famous sons and the establishment of the Menninger Clinic. The author is frank and outspoken, but sympathetic, in describing the members of the Menninger family, telling of their weaknesses as well as of their strengths.

Much of the book is devoted to the Mental Health Movement and the efforts of the Menningers to raise the standards of care for the mentally ill and to train psychiatrists. The Menninger Clinic, which was originally conceived by Dr. C. F. to be a general clinic for Topeka patterned after the Mayo Clinic, grew instead to be one of the most outstanding psychiatric clinics in the United States.

As one closes the book, one has the feeling that Dr. C. F. built the Clinic on such a firm foundation that even though his death removed him from the helm, the Menninger Clinic under the direction of his two doctor sons, Dr. Karl and Dr. Will, will continue to be a leader in psychiatric progress for many years to come.

M.M.P.

RELIABILITY!

For years we have maintained the highest standards of quality, expert workmanship and exacting conformity to professional specifications . . . a service appreciated by physicians and their patients.

ARTIFICIAL LIMBS, TRUSSES,
ORTHOPEDIC APPLIANCES,
SUPPORTERS, ELASTIC HOSIERY

Prompt, painstaking service

Buchstein-Medcalf Co.
223 So. 6th St. Minneapolis 2, Minn.

DANIELSON MEDICAL ARTS PHARMACY, INC.

PHONES:
FEderal 3-3317
FEderal 3-3318

10-14 Arcade, Medical Arts Building
825 Nicollet Avenue—Two Entrances—78 South Ninth Street
MINNEAPOLIS

HOURS:
WEEK DAYS—8 to 7
SUN. & HOL.—10 to 1

organomercurial diuretics "...permit ingestion of enough salt to make food palatable; without them, many patients would lose their appetites, a consequence of the salt-free diet which has occasionally been known to cause serious malnutrition."*

*Modell, W.: The Relief of Symptoms, Philadelphia, W. B. Saunders Company, 1955, pp. 265-266.

03156

GYNECOLOGIC CYTOLOGY SERVICE

Interpretation of Cervico-Vaginal, Etc.
(Papanicolaou) Smears
for the
Diagnosis of Carcinoma

Kits (Slides, Spatulas, Fixative and
Mailing Containers)
and
Instructions for Taking and Mailing
Smears furnished on request

M. WM. RUBENSTEIN, M.D.
GYNE-CYTOLOGY LABORATORY
636 Church Street, Room 517 Evanston, Illinois

RADIUM RENTAL SERVICE
4340 CEDARWOOD ROAD
MINNEAPOLIS 5, MINNESOTA
TEL. FE 3-5297

Radium element prepared in type of applicator requested

ORDER BY TELEPHONE OR MAIL
PRICES ON REQUEST

EVERY WOMAN
WHO SUFFERS
IN THE
MENOPAUSE
DESERVES
"PREMARIN"®

widely used
natural, oral
estrogen

AYERST LABORATORIES
New York, N.Y. • Montreal, Canada
5646

Classified Advertising

Replies to advertisements with key numbers should be mailed in care of MINNESOTA MEDICINE *2642 University Avenue, Saint Paul 14, Minnesota.*

PHYSICIAN NEEDED—In county seat town of 1800, located in excellent farming community, Central Minnesota. No other physician within 35-mile radius. New 25-bed hospital planned. Good schools and housing. Office available. Address Kenneth Mattson, Mahnomen, Minnesota.

WANTED—Ophthalmologist in North Minneapolis. None now in entire area. New air-conditioned, ground-floor building. Six general practitioners now located; this one space available. Telephone ALdrich 8402 or ALdrich 4719. Write 710 West Broadway, Minneapolis 11.

PHYSICIAN WANTED—Community of 4,000 needs physician and surgeon: resort area; new Clinic building just completed and future hospital assured; living quarters available. Write Secretary, Kelliher Hospital, Kelliher, Minnesota.

DOCTOR URGENTLY NEEDED in Le Center, Minnesota. Fully equipped new office, new home, available in beautiful, prosperous community 60 miles from Twin Cities. Previous man left to specialize. Call, write or see Miles Bowler, Mayor, Le Center, Minnesota.

WANTED—General practitioner for State Hospital. Salary range $641 to $781 per month. Quarters available, subsistence, laundry, and garage. Government working conditions, paid holidays, vacation, sick leave, and retirement pension plan. Write Superintendent, Fergus Falls State Hospital, Fergus Falls, Minnesota.

PHYSICIAN WANTED—Young, general practitioner interested in obstetrics and pediatrics, to join three-man suburban group in new building. Address E-543, care MINNESOTA MEDICINE.

FOR SALE—Eye, Ear, Nose and Throat practice of late Dr. A. V. Garlock, Bemidji, Minnesota. Established forty-two years. Large surrounding territory, over 100-mile radius. Only Eye, Ear, Nose and Throat practice in area. Practice, records, latest equipment. Write Mrs. A. V. Garlock, Bemidji, Minnesota. Telephone 1652 J.

FOR SALE—Complete office equipment, also portable 15 ma x-ray, BMR, nearly new autoclave, ECG. Excellent condition, reasonable. Address E-541, Care MINNESOTA MEDICINE.

PLACEMENT SERVICE

The Minnesota State Medical Association maintains a Medical Placement Service for the benefit of physicians who are looking for locations and positions; also for communities, medical groups and physicians who are looking for licensed medical assistance. For information, write to the Minnesota State Medical Association, 496 Lowry Medical Arts Bldg., Saint Paul 2, Minnesota.

LOCATION WANTED—Board-qualified general surgeon desires location. Address E-542, care MINNESOTA MEDICINE.

APARTMENT WANTED, furnished, by single physician to start practice in Hopkins September 1. Consider sharing suitable quarters. Write E-539, care of MINNESOTA MEDICINE.

DOCTOR OR DENTIST—Beautiful suite in South Minneapolis. Very modern. Six months free rent. Then option of lease at very reasonable rent. Wm. L. Cochrane, 4101 - 42nd Avenue South, Minneapolis, Minnesota. Telephone Ro 9-8758.

FOR RENT—Highland Shopping Area, equipped office available, full or part time. Share with surgeon and dentist. Excellent for general practice, obstetrics, pediatrics. No equipment necessary; no rent until established. H. Schwyzer, M.D., 2069 Ford Parkway, Saint Paul. Telephone: MI 8-4832 or CA 4-7416.

ATTENTION DENTISTS AND DOCTORS—Modern space available for dentists' and doctors' offices. A location where several sets of doctors and dentists have been long established and then built their own clinics. A money maker. Above Kisch's Food Market. Plenty of auto parking space. Apply 637 Stryker Avenue, Saint Paul, Minnesota.

FOR RENT OR SALE—Eight-room, first-floor physician's office. Well equipped. Near Twin Cities. Gross over $30,000. New hospital—unlimited privileges. Good opportunity. Write E-511, care MINNESOTA MEDICINE.

FOR SALE—Used General Electric, 100 milliampere x-ray machine, good as new. Model R-2-39, Serial Number 288395. Completely dismantled. Ready for shipment anywhere. Interested buyer can be assured of good deal. Write or call Grand Rapids Clinic, 504 First Avenue N.W., Grand Rapids, Minnesota. Telephone FAirview 6-3436.

The Birches Sanitarium, Inc.

2391 Woodland Avenue
Duluth 3, Minnesota

A hospital for the care and treatment of Nervous and Mental disorders. Quiet, cheerful environment. Specially trained personnel. Recreational and occupational therapy.

Dr. L. R. Gowan, M.D., M.S., Medical Director

Index to Advertisers

Aloe, A. S. Co. A-22
American National Bank of Saint Paul A-36
Ames Co., Inc. .... Cover III
Anderson, C. F., Co., Inc. A-28
Ayerst Laboratories A-39

Benson Optical Co. A-17
Birches Sanitarium A-41
Brown & Day, Inc. A-42
Buchstein-Medcalf Co. A-38
Burroughs Wellcome & Co. A-4

Caswell-Ross Agency 526-A
Ciba A-24
Classified Advertising A-40
Coca-Cola A-26
Cook County Graduate School of Medicine A-28
Corn Products Refining Co. A-14

Dalco Pharmacal Co. A-16, A-36
Danielson Medical Arts Pharmacy, Inc. A-38
Druggists Mutual Insurance Co. A-41

Foot-so-Port Shoe Co. A-42

Gyne-Cytology Laboratory A-39

Hoffmann-La Roche .... Insert facing page A-20

Juran & Moody, Inc. A-20

Lakeside Laboratories A-27, A-39, A-42
Lederle Laboratories 526-B, 526-C, A-36
Lilly, Eli, & Co. .... Cover I, A-32

Medical Protective Co. A-42
Merck Sharp & Dohme A-6, A-7, A-11, A-18, A-19, A-21, A-29, A-37

Parke, Davis & Co. .... Cover II, A-1
Pfizer Laboratories, Division Chas. Pfizer & Co., Inc. A-9, A-23
Physicians Casualty & Health Associations A-28
Physicians & Hospitals Supply Co. A-34, A-35

Radium Rental Service A-39
Riker A-25

St. Croixdale Sanitarium A-22
St. Paul Fire & Marine Insurance Co. A-24
Schering Corporation .... A-12, A-13, Insert facing A-16, A-30, A-31
Searle, G. D., & Co. A-33
Smith, Kline & French Laboratories .... Cover IV
Squibb A-8
Sutliff & Case Co., Inc. A-17

Trautman, Ray, & Son A-26

Viceroy Cigarettes A-10

Wallace Laboratories 526-D
Winthrop Laboratories A-5
Wyeth A-15

Insurance at a Saving

Druggists' Mutual Insurance Company
OF IOWA, ALGONA, IOWA
Fire - Tornado - Automobile Insurance

Prompt Loss Service

MINNESOTA REPRESENTATIVE—S. E. STRUBLE, WYOMING, MINN.

Brown & Day, Inc.

For your

Allergy and Asthma Patients

The new Raytheon

MICRONAIRE

Electrostatic
Air Cleaner

gives prompt symptomatic relief. Convenient portable room unit removes 99.2% of airborne extrinsic inhalant allergens—*down to particles as fine as smoke!*

Cleans Air 6 Times an Hour in Average Size Room.

ASK FOR FOLDER

"Everything for the Physician"

for fast service call
CA 2-1845

BROWN & DAY INC. SAINT PAUL U.S.A. SERVICE QUALITY

62-64 EAST 5TH ST
St. Paul 1, Minn.

PERSPIRATION PROOF
Insoles do not crack or curl from perspiration★

- Insole extension and wedge at inner corner of heel where support is most needed.
- The patented arch support construction is guaranteed not to break down.
- ★ Innersoles guaranteed not to crack or collapse.
- Foot-so-Port lasts designed and the shoe construction engineered with orthopedic advice.
- Conductive Shoes for surgical and operating room personnel. N.B.F.U. specifications.
- We are also the manufacturer of the Gear-Action Shoe designed by noted orthopedic surgeon.
- We make more shoes for polio, club feet and disabled feet than any other shoe manufacturer.

Send for free booklet, "The Preservation of the Function of the Foot Balancing and Synchronizing the Shoe with the Foot."

Write for details or contact your local **FOOT-SO-PORT** *Shoe Agency. Refer to your Classified Directory*

Foot-so-Port Shoe Company, Oconomowoc, Wis.
A Division of Musebeck Shoe Company

"...in patients with moderately severe and severe cardiac failure, neohydrin is the oral diuretic of choice."*

*Moyer, J. H., and others:
J. Chronic Dis. 2:670, 1955.

0305-

Malpractice Prophylaxis

With us
1925—1 suit filed per 65 policyholders
1935—1 suit filed per 86 policyholders
1945—1 suit filed per 222 policyholders
1955—1 suit filed per 227 policyholders

Specialized Service makes our doctor safer

THE
MEDICAL PROTECTIVE COMPANY
FORT WAYNE, INDIANA

Professional Protection Exclusively since 1899

MINNEAPOLIS Office:
Robert L. McFerran, Rep.
311 East 24th St., Apt. A-1
Telephone Federal 9-1292

for results you can trust...

patients' reports you can rely on...

color
calibrated
CLINITEST®
BRAND

the urine-sugar test with the Laboratory-Controlled color scale

- clear-cut color changes in the clinically significant range
- avoids trace reactions that confuse the clinical picture
- close correlation with quantitative tests

AMES

AMES COMPANY, INC • ELKHART, INDIANA
Ames Company of Canada, Ltd., Toronto

05556

physical sluggishness . . .

decreased mental and emotional control . . .

decreased function in various organ systems

In many of the clinical problems caused by Metabolic Insufficiency you will see *positive improvement within several days.* This is because 'Cytomel' stimulates metabolism at the cellular level.

5 mcg. and 25 mcg. (scored) tablets

Cytomel*

a new agent for treatment of Metabolic Insufficiency

Smith, Kline & French Laboratories, Philadelphia

LT3

*Trademark for L-triiodothyronine, S.K.F.

COLLEGE OF PHYSICIANS LIBRARY

Minnesota MEDICINE

PUBLISHED MONTHLY BY THE MINNESOTA STATE MEDICAL ASSOCIATION

Volume 39 SEPTEMBER, 1956 Number 9

Printed in U.S.A. (Table of Contents—Pages A-2 and A-3) 40c a copy—$3.00 a year

FOR THOSE WHO DEVELOP NASAL CONGESTION ON RESERPINE THERAPY

'Sandril' c̄ 'Pyronil'

(RESERPINE, LILLY) (PYRROBUTAMINE, LILLY)

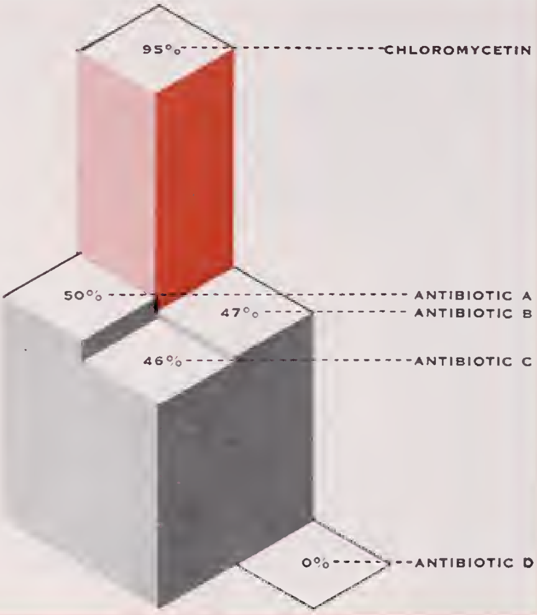
About 50% of all patients experience this annoying side-effect. 'Sandril' c̄ 'Pyronil' relieves 75% of those affected.

Each tablet combines 0.25 mg. 'Sandril' and 7.5 mg. 'Pyronil.'

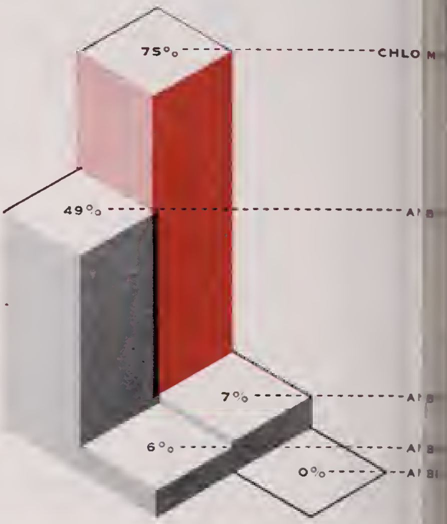
Lilly

571075

SENSITIVITY OF COMMON PATHOGENS TO CHLOROMYCETIN AND FOUR OTHER MAJOR ANTIBIOTIC AGEN

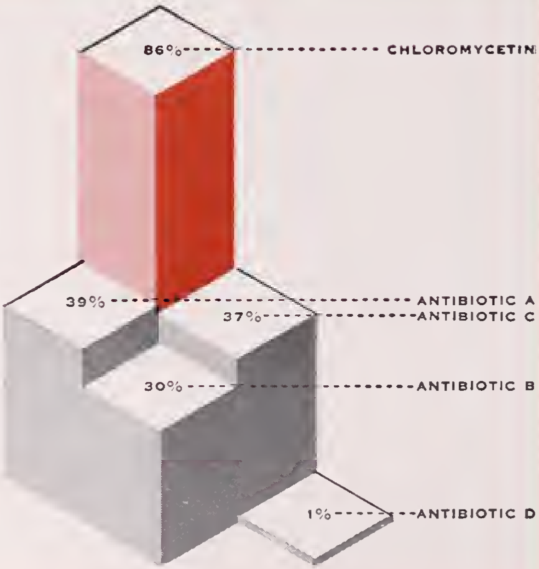


ESCHERICHIA COLI
(148-227 STRAINS)

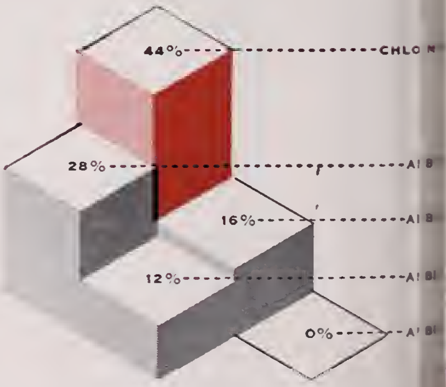


BACILLUS PROTEUS
(63-104 STRAINS)

AEROBACTER AEROGENES
(143-248 STRAINS)



PSEUDOMONAS AERUGINOSA
(39-70 STRAINS)



*This graph, based on *in*
is adapted from Horton

when more than one organism is involved...

Chloromycetin®

for today's problem pathogens

Therapeutic advantages of CHLOROMYCETIN (chloramphenicol, Parke-Davis) are especially appreciated when mixed infections are encountered because it provides highly effective antibiotic action both against gram-negative and against gram-positive pathogens.[1-7] CHLOROMYCETIN also acts against many pathogens which may grow when originally sensitive organisms have been suppressed.[2]

Unlike some antibacterial agents which are specific for one type of organism only, or others to which bacterial resistance readily develops, CHLOROMYCETIN demonstrates continued efficacy against a wide variety of commonly occurring microorganisms: "Sensitivity of many strains of pathogens to chloramphenicol [CHLOROMYCETIN] and limited tendency of these organisms to develop resistance to this antibiotic explain the effectiveness of chloramphenicol where other antibiotics and chemotherapeutic agents have failed."[1]

CHLOROMYCETIN is a potent therapeutic agent, and because certain blood dyscrasias have been associated with its administration, it should not be used indiscriminately or for minor infections. Furthermore, as with certain other drugs, adequate blood studies should be made when the patient requires prolonged or intermittent therapy.

References: (1) Felix, N. S.: *Pediat. Clin. North America* 3:317, 1956. (2) Joron, G. E.; Fowler, A. F.; de Vries, J.; Reid, G., & Mathews, W. H.: *Canad. M. A. J.* 73:956, 1955. (3) Weil, A. J., & Stempel, B.: *Antibiotic Med.* 1:319, 1955. (4) Perry, R. E., Jr.: *North Carolina M. J.* 16:567, 1955. (5) Jones, C. P.; Carter, B.; Thomas, W. L., & Creadick, R. N.: *Obst. & Gynec.* 5:365, 1955. (6) Murphy, F. D., & Waisbren, B. A., in Murphy, F. D.: Medical Emergencies: Diagnosis and Treatment, ed. 5, Philadelphia, F. A. Davis Company, 1955, p. 557. (7) Altemeier, W. A.; Culbertson, W. R.; Sherman, R.; Cole, W.; Elstun, W., & Fultz, C. T.: *J.A.M.A.* 157:305, 1955. (8) Horton, B. F., & Knight, V.: *J. Tennessee M. A.* 48:367, 1955.

PARKE, DAVIS & COMPANY
DETROIT 32, MICHIGAN

60024

Volume 39
Number 9

Minnesota

Contents fo

SCIENTIFIC ARTICLES

ORIGINAL CONTRIBUTIONS

Metabolic Relationships of Potassium, Nitrogen and Sodium
Paul R. Cannon, M.D., Chicago, Illinois 567

The Present Status of the Serofloculation Reaction
Harry S. Penn, M.D., Los Angeles, California 571

Resectional Surgery for Pulmonary Tuberculosis
Melvin M. Reeves, M.D., Ivan D. Baronofsky, M.D., Lyle Tongen, M.D., Coleman Connolly, M.D., and *F. John Lewis, M.D.,* Minneapolis and Saint Paul, Minnesota 577

X-Ray Pelvimetry by the Colcher-Sussman Method
D. W. Freeman, M.D., Minneapolis, Minnesota 583

Hennepin County Neonatal Mortality Study, 1953 Report 586

CASE PRESENTATION

Abscess of the Tongue
Vernon A. Vix, M.D., Worthington, Minnesota 597

SEMINAR

Reactions to Penicillin. I. Review of the Literature Concerning Severe Reactions (English and North American)
Donald J. Corr, M.D., and *William E. Wellman, M.D.,* Rochester, Minnesota .....

CONTINUATION STUDIES

Glaucoma and the Family Doctor
Richard C. Horns, M.D., Minneapolis, Minnesota .....

PULMONARY PAGE

New Problems in the Tuberculosis Field
M. M. Williams, M.D., and *L. A. Olson, M.D.,* Ah-gwah-ching, Minnesota .....

CLINICAL NOTES

Care of the Terminal Cancer Patient
Frederick M. Owens, Jr., M.D., Saint Paul, Minnesota

CURRENT CARDIAC CONCEPTS

Physical Signs of Functional Heart Disease
Geoffrey Bourne, London, England .....

Official Journal of

Duluth Surgical Society
Minneapolis Academy of Medicine
Minneapolis Obstetrical and Gynecological Society
Minneapolis Surgical Society
Minnesota Academy of Medicine
Minnesota Obstetric and Gynecologic Society

Owner and Publisher

Published by MINNESOTA STATE MEDICAL ASSOCIATION
496 Lowry Medical Arts Building
St. Paul 2, Minnesota

Editing and Publishing Committee

E. M. Hammes, M.D.
Chairman, Saint Paul

F. M. Owens, Jr., M.D.
Saint Paul

T. A. Peppard, M.D.
Minneapolis

Henry Ulrich, M.D.
Minneapolis

Business Manager

R. R. Rosell
496 Lowry Medical Arts Building
St. Paul 2, Minnesota

GENER

Authors

Manuscripts should be addressed to Arthur H. Wells, M.D., Editor, 915 East 1st Street, Duluth 5, Minnesota. Telephone RA 7-6636 or JA 5-2319. Original papers prep for publication solely in Minnesota Medicine will be considered by the Board of Ed providing they fulfill the following editorial standards. Manuscripts should be t double spaced on white paper with at least 1-inch margins. The original (not a ca copy) is requested. The title on the first page should be under six words if pos or divided into two parts. The author should give his highest degree, his instituti position or his relationship to a hospital or medical organization which he may addressing. Pages should be numbered consecutively and the author's last name sh appear at the top of each page after the first page.

Biographical references should appear on a separate sheet entitled "Bibliography." should appear and be numbered consecutively in the order in which they first occu the text (not alphabetically). Citations in the text require reference numbers if author's or authors' names are not used or if there is more than one reference to same author or group of authors. All references to author should appear in Bibliography and no references should be included which are not in the text. The and exact punctuation used in the J.A.M.A. references is requested. For a journal th *Author's last name, initial, initial.: title of paper. Abbreviated name of journal, vol number: page, year.* Book references should give author, title, edition number, publisher and year.

Illustrations (photographs, tables and graphs) should be submitted separately and combined in the text. There should be a separate sheet entitled "Illustrations" w contains the various types of illustrations listed separately and numbered in the o

Medicine

eptember, 1956

Volume 39
Number 9

MISCELLANEOUS ARTICLES

ITORIALS

lectrokymography ... 618
erodiagnosis of Cancer ... 618
alue of a Savings Account ... 619
hotoengraving ... 620
olor TV—The Big Quandary ... 621
he History of Glass Containers ... 621
ehabilitation in Pulmonary Tuberculosis ... 622
rouble Is Their Business ... 623
hy Convenience Foods? ... 624
eadership Survey ... 625

MEMORIAM ... 625

ESIDENT'S LETTER

he Presidential Address ... 626

DICAL ECONOMICS

resident Signs Social Security Bill ... 628
residential Signature Completes Action on Other Bills 628
dministration Urges Construction Aid to Medical Schools ... 628
Narcotics Control Bill Passes Congress ... 628
Cabinet Status Asked for U. S. Civil Defense Agency ... 628
Allocation Program of Salk Vaccine Ends ... 628
$35 Million Allocated for Vocational Rehabilitation ... 629
Sears, Roebuck Foundation Announces Loans ... 629
West German Medical Education Surveyed ... 629
Study Shows Aged Becoming Less Dependent ... 629
Family Income Before Taxes up in 1955 ... 629
Women Physicians Outnumber Men in USSR ... 629
Medicine Ranked Most Desirable Career by Teen-agers 629
Doctors' Fees Still Behind Overall Cost of Living ... 629
Number of Specialists on the Rise ... 630
Physicians Can Deduct for Refresher Courses ... 630
AMA Revises Principles of Medical Ethics ... 630
Patients' Code of Conduct Rejected ... 631

MEETINGS AND ANNOUNCEMENTS ... 632

WOMAN'S AUXILIARY ... 634

GENERAL INTEREST ... A-38

BOOK REVIEWS ... A-43

Minnesota Society of Clinical Pathologists
Minnesota Society of Internal Medicine
Minnesota Society of Neurology and Psychiatry
Minnesota State Medical Association
Minnesota Surgical Society
Northern Minnesota Medical Association
Southern Minnesota Medical Association

FORMATION

which they appear in the text. All photographs must be in black and white, clear contrasting, and on glossy prints. Instructions for combining photographs are ptable. Any number of illustrations over 4 are charged to the author. Combinations hotographs up to one-half page (6 x 4⅜ inches) count as 1 illustration.

ders and Reviewers

he right is reserved to reject material submitted for reading or advertising columns. views expressed in this journal do not necessarily represent those of the Minnesota Medical Association or any of its constituents.

ertisers and Subscribers

assified advertising—10 cents a word; minimum charge $2.00; key number, 25c tional. Remittance should accompany order. Display advertising rates on request.

nnual Subscription—$3.00. Single Copies—$0.40. Foreign and Canadian—$3.50.

ommunications concerning advertising and subscriptions should be addressed to NESOTA MEDICINE, 2642 University Avenue, Saint Paul 14, Minnesota. Telephone Mid- 6-2641.

pyright and Post Office Entry

ontents of MINNESOTA MEDICINE ©1956 by Minnesota State Medical Association.

ntered at the Post Office in Saint Paul as second class matter. Accepted for mailing at special rate of postage provided for in Section 1103, Act of October 3, 1917, orized July 13, 1918.

Board of Editors

ARTHUR H. WELLS, M.D.
Editor-in-Chief, Duluth

STUART W. ARHELGER, M.D.
Minneapolis

JOHN F. BRIGGS, M.D.
Saint Paul

S. FRANCIS CEPLECHA, M.D.
Redwood Falls

TAGUE C. CHISHOLM, M.D.
Minneapolis

ROBERT B. HOWARD, M.D.
Minneapolis

R. DREW MILLER, M.D.
Rochester

HENRY G. MOEHRING, M.D.
Duluth

GLENN J. MOURITSEN, M.D.
Fergus Falls

OLIVE V. SEIBERT, B.A.
Saint Paul

GEORGE STILWELL, M.D
Rochester

Get the Facts!!

about the

PROFESSIONAL CREDIT PROTECTIVE BUREAU

The Professional Credit Protective Bureau has proved very beneficial to many professional people who have adopted this excellent credit control and collection service.

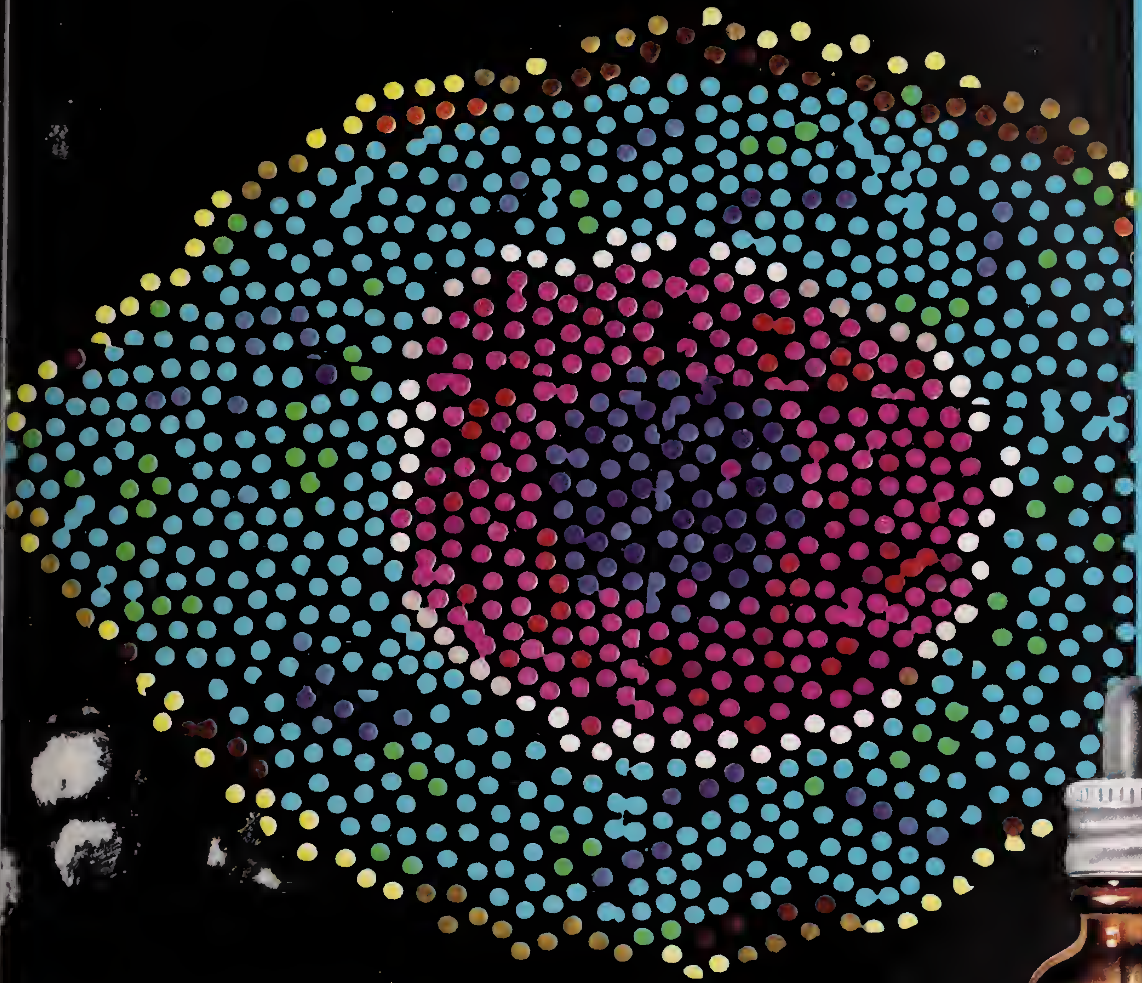
We urge you to make use of this service since it will be of great benefit in recovering long delinquent accounts and in eliminating, through proper control measures, the accumulation of slow and bad accounts.

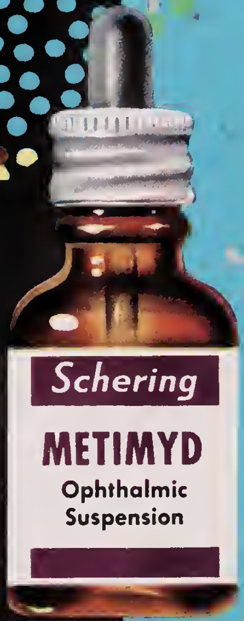
Professional Credit Protective Bureau
701 Metropolitan Bldg., Minneapolis 1, Minn.

YES, I would like to give the PROFESSIONAL CREDIT PROTECTIVE BUREAU a trial. Please ask one of their representatives to call on me without obligation to explain the plan in detail.

NAME ....

ADDRESS ....




Schering
METIMYD
Ophthalmic
Suspension

widest
approach
to
eye disorders

combines prednisolone and sulfacetamide
antibacterial
antiallergic
anti-inflammatory

also available as METIMYD Ointment with Neomycin

METIMYD,* brand of prednisolone acetate and sulfacetamide sodium.

*T.M. MM-J-2-456

Schering
STERILE
OPHTHALMIC
PREPARATIONS

perfect
fusion
for
sharp
focus
in
eye disorders

- infection
- inflammation
- injury
- allergy

Sodium SULAMYD,® brand of Sulfacetamide Sodium U.S.P.
METIMYD,* brand of prednisolone acetate and sulfacetamide sodium.
CORTICLORON,® brand of cortisone acetate and chlorprophenpyridamine preparations.

*T.M.

MM-J-1-456

Announcing...
a new name

'LANOXIN'
brand
DIGOXIN

formerly known as Digoxin 'B. W. & Co.'®

The new name has been adopted
to make easier for everyone
the distinction between
Digoxin and Digitoxin.

Now simply write:

'Lanoxin' Tablets 0.25 mg. or 0.5 mg.
'Lanoxin' Elixir Pediatric, or
'Lanoxin' Injection

to provide the unchanging safety and predictability afforded by the uniform potency, uniform absorption, brief latent period and optimum rate of elimination of this crystalline glycoside.

Tablets:	*0.25 mg. (white) and 0.5 mg. (green)*
Elixir Pediatric:	*0.05 mg. in each cc.*
Ampuls:	*0.5 mg. in 2 cc.*

BURROUGHS WELLCOME & CO. (U.S.A.) INC., *Tuckahoe, New York*

Meat...

and Its Place in the Diet in Congestive Cardiac Failure

Meat has an appropriate place in the moderate-protein, low-sodium, acid-ash diet advocated in the dietary management of patients with congestive cardiac failure.[1] When extreme sodium restriction is necessary, the meat allowance is regulated accordingly.

Lean meat allows maintenance of a positive nitrogen balance without excessive protein intake, because its amino acids match the quantity and proportions needed for tissue synthesis and repair.[2,3] In the fresh state as purchased it supplies only small amounts of sodium ranging from approximately 50 to 100 mg. per 100 grams. Due to its acid-ash composition (equivalent to 4 to 38 ml. of normal acid per 100 grams of meat) it may facilitate diuresis.[1]

In addition to these important features, meat contributes valuable nutritional factors by virtue of its generous supply of high quality protein, B vitamins, and essential minerals—iron, phosphorus, potassium, and magnesium.

Easy digestibility, a prime requisite of foods eaten by the patient with congestive cardiac failure, is another outstanding quality of meat.

---

1. Odel, H. M.: Nutrition in Cardiovascular Disease, in Wohl, M. G., and Goodhart, R. S.: Modern Nutrition in Health and Disease, Dietotherapy, Philadelphia, Lea & Febiger, 1955, p. 709.

2. Berg, C. P.: Utilization of Protein, J. Agr. & Food Chem. *3*:575 (July) 1955.

3. Best, C. H., and Taylor, N. B.: The Physiological Basis of Medical Practice, ed. 6, Baltimore, Williams & Wilkins, 1955, p. 638.

The nutritional statements made in this advertisement have been reviewed by the Council on Foods and Nutrition of the American Medical Association and found consistent with current authoritative medical opinion.

American Meat Institute
Main Office, Chicago...Members Throughout the United States

ORAL PENICILLIN

FOR ***BETTER***

AND ***MORE CONSISTENT*** ABSORPTION

"Because of the better and more consistent absorption of penicillin V from the intestinal tract, it would appear that this type of penicillin is preferable to penicillin G when oral administration is to be used."[1]

PEN•VEE•*Oral* and PEN•VEE *Suspension* permit new dependability in oral-penicillin therapy—dependable stability in gastric acid, dependable and optimal absorption in the duodenum. "Not being destroyed by acid in the stomach, as is penicillin G, penicillin V remains available in larger amounts for absorption."[1]

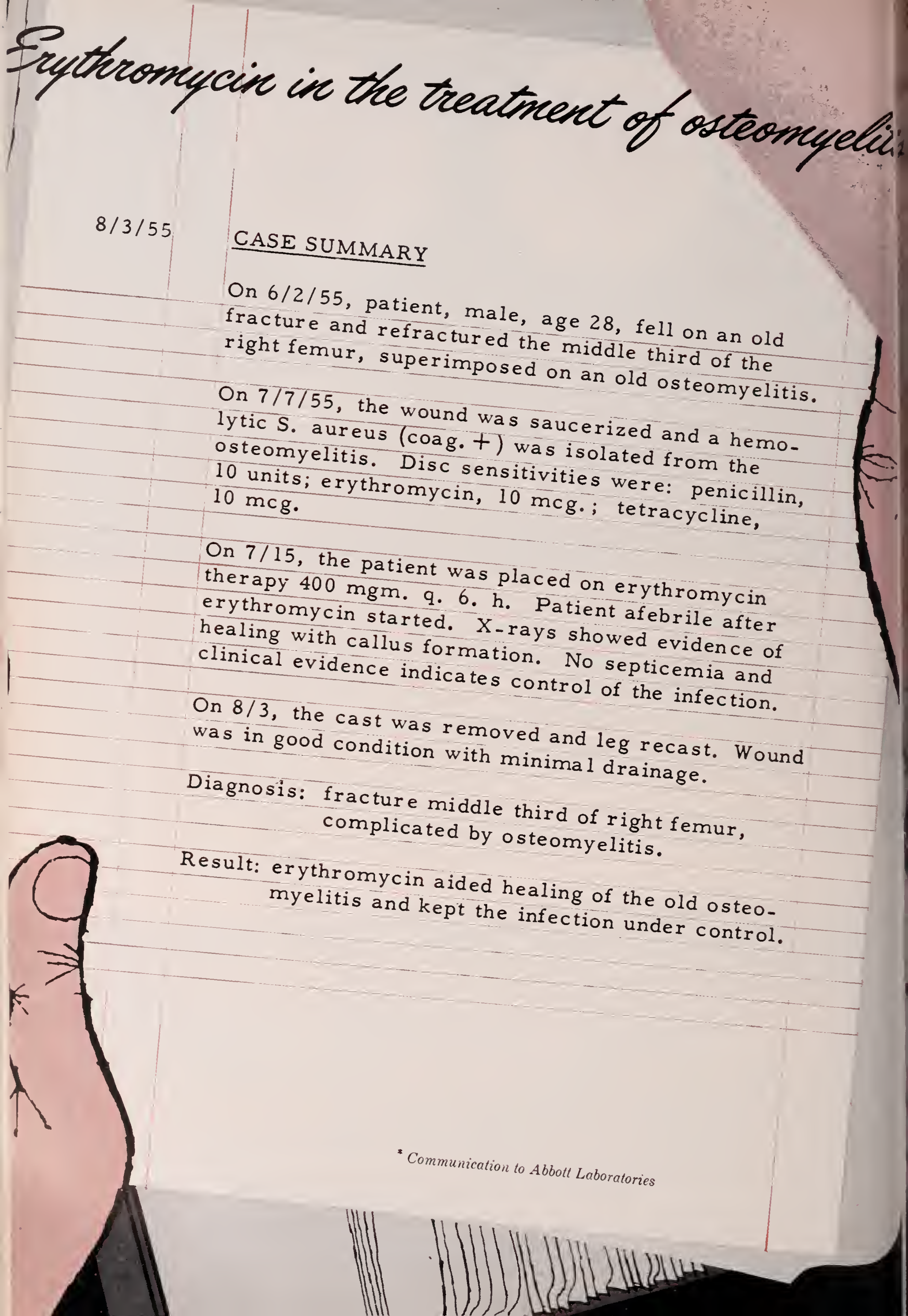
1. Martin, W. J., et al.: J.A.M.A. *160*:928 (March 17) 1956.

PEN•VEE* *Oral* and *Suspension*

PEN•VEE•*Oral* is Penicillin V, Crystalline Phenoxymethyl Penicillin)
PEN•VEE *Suspension* is Benzathine Penicillin V Oral Suspension

*rademark

Wyeth®
Philadelphia 1, Pa



Erythromycin in the treatment of osteomyeli

8/3/55

CASE SUMMARY

On 6/2/55, patient, male, age 28, fell on an old fracture and refractured the middle third of the right femur, superimposed on an old osteomyelitis.

On 7/7/55, the wound was saucerized and a hemolytic S. aureus (coag. +) was isolated from the osteomyelitis. Disc sensitivities were: penicillin, 10 units; erythromycin, 10 mcg.; tetracycline, 10 mcg.

On 7/15, the patient was placed on erythromycin therapy 400 mgm. q. 6. h. Patient afebrile after erythromycin started. X-rays showed evidence of healing with callus formation. No septicemia and clinical evidence indicates control of the infection.

On 8/3, the cast was removed and leg recast. Wound was in good condition with minimal drainage.

Diagnosis: fracture middle third of right femur,
complicated by osteomyelitis.

Result: erythromycin aided healing of the old osteomyelitis and kept the infection under control.

---

* *Communication to Abbott Laboratories*

ecific against

ccic infections

Specific—because you can actually pinpoint the therapy for coccic infections. That's because most bacterial respiratory infections are caused by staph-, strep-and pneumococci. And these are the very organisms most sensitive to Erythrocin—even when in many cases they resist other antibiotics.

filmtab®

Erythrocin®

(Erythromycin, Abbott)

STEARATE

th little risk of

rious side effects

Low toxicity—because Erythrocin rarely alters intestinal flora. Thus, your patients seldom get gastroenteral side effects. Or loss of vitamin synthesis in the intestine. Virtually, no allergic reactions, either. *Filmtab* Erythrocin Stearate (100 and 250 mg.), bottles of 25 and 100. Abbott

filmtab®

Erythrocin®

(Erythromycin, Abbott)

STEARATE

® Filmtab—film-sealed tablets; pat. applied for

609216

How to win *little* friends . . .

CHILDREN'S SIZE
BAYER
ASPIRIN
48 TABLETS
25¢
FLAVORED
Children's Size
BAYER®
ASPIRIN
BAYER
Genuine
48 TABLETS
25¢
1¼ GRS. EA.
THE BEST TASTING ASPIRIN YOU CAN GIVE YOUR CHILD
℞

The Best Tasting Aspirin you can prescribe.

The Flavor Remains Stable down to the last tablet.

25¢ Bottle of 48 tablets (1¼ grs. each).

We will be pleased to send samples on request.

THE BAYER COMPANY DIVISION of Sterling Drug Inc. 1450 Broadway, New York 18, N. Y.

for
preventing and
treating upper
respiratory
infections

new!

Achrocidin*

TETRACYCLINE-ANTIHISTAMINE-ANALGESIC COMPOUND

ACHROCIDIN provides in one tablet all the drugs which are often prescribed separately for the prevention and treatment of cold complications — conditions such as otitis, adenitis, sinusitis, and others. This comprehensive formula 1) provides potent therapeutic and prophylactic action against a wide variety of infective organisms, 2) relieves pain and discomfort, 3) depresses fever, 4) alleviates nasal congestion.

Available on prescription only

Each tablet contains:

ACHROMYCIN® Tetracycline	125 mg.
Phenacetin	120 mg.
Caffeine	30 mg.
Salicylamide	150 mg.
Chlorothen Citrate	25 mg.

Bottle of 24 tablets.

Average adult dose: 2 tablets, 4 times daily

Lederle LEDERLE LABORATORIES DIVISION, AMERICAN CYANAMID COMPANY, PEARL RIVER, NEW YORK

*TRADE-MARK

save the cigarette for later... Time was you had to wait for a local anesthetic to take hold —you waited, patient waited, nurse waited. **Now, rapid anesthesia....** Blockain* works so fast that clinicians had to describe it as "immediate" and "almost instantaneous." It's practically an understatement to call its action "rapid." **Longer anesthetic duration....** Besides being able to go to work sooner, you can work at an easier pace. Blockain lasts long enough so you can proceed from incision to closure on one injection. You finish up with a neat suture line undistorted by repeated instillations. The patient leaves uncomplaining and comfortable. ☞ *A busy clinician's experience with Blockain in fourteen cases of Colles' fracture:* A single 2-5 cc. injection of Blockain into the hematoma produced anesthesia in an average of 3 minutes 15 seconds. The average duration of these operations, closed reductions, was 25 minutes. Anesthesia persisted beyond the time required for reduction permitting splints to be applied, postreduction X-rays to be taken and the patients sent home feeling comfortable. **BLOCKAIN,** 30 cc., 0.5% (5 mg/cc.). Your office-ideal local anesthetic. For additional information write GEORGE A. **Breon** & COMPANY, 1450 Broadway, New York 18, N. Y.

*BLOCKAIN® BRAND OF PROPOXYCAINE HYDROCHLORIDE BREON.

new

+

B_6

Striking relief from nausea of pregnancy

‘MAREDOX’

brand Cyclizine Hydrochloride and
Pyridoxine Hydrochloride

Just one tablet a day, on rising or at night, restores the nausea-free status to most pregnant women.

Each tablet of ‘Maredox’ contains:
‘Marezine’® brand
Cyclizine Hydrochloride . . . . 50 mg.
Pyridoxine Hydrochloride . . . . . . 50 mg.

BURROUGHS WELLCOME & CO. (U. S. A.) INC., Tuckahoe, New York

Simple as Simple Arithmetic
1 + 1 = 2
BAKER'S + H_2O
20 CALORIES PER FLUID OZ.
BAKER'S MODIFIED MILK

With little chance of error in Formula Preparation

BAKER'S MODIFIED MILK*

Feeding Directions

Baker's Modified Milk (Liquid)

(Normal dilution for liquid provides 20 calories per liquid ounce.)

	Baker's	Boiled Water
Hospital	1 part	2 parts
First week at home	1 part	1½ parts
After first week at home	1 part	1 part

Also available in powder form. Normal dilution one tablespoon to 2 ounces of water provides 20 calories per fluid ounce.

Designed for all infant feeding from birth to the end of the first year, Baker's Modified Milk is a time-saver for busy physicians and busy hospitals.

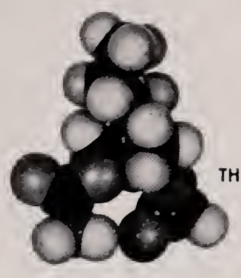
Baker's Modified Milk is furnished gratis to all hospitals for your use.

*Made exclusively from Grade A milk (U. S. Public Health Service Milk Code) which has been modified by replacement of the milk fat with vegetable and animal fats and by the addition of carbohydrates, vitamins and iron.

THE BAKER LABORATORIES, INC.

Milk Products Exclusively for the Medical Profession

MAIN OFFICE: CLEVELAND 3, OHIO • PLANT: EAST TROY, WISCONSIN



THE MILTOWN MOLECULE

A tranquilizer well suited for prolonged therapy

NO ORGANIC CONTRAINDICATIONS

reported to date

- well tolerated, non-addictive, essentially non-toxic
- no blood dyscrasias, liver toxicity, Parkinson-like syndrome or nasal stuffiness
- chemically unrelated to chlorpromazine or reserpine
- does not produce significant depression
- orally effective within 30 minutes for a period of 6 hours

Indications: anxiety and tension states, muscle spasm.

Miltown®

THE ORIGINAL MEPROBAMATE

DISCOVERED AND INTRODUCED by Wallace Laboratories, New Brunswick, N. J.

2-methyl-2-n-propyl-1,3-propanediol dicarbamate—U. S. Patent 2,724,720

SUPPLIED: 400 mg. scored tablets. Usual dose: 1 or 2 tablets t.i.d.

Literature and Samples Available on Request

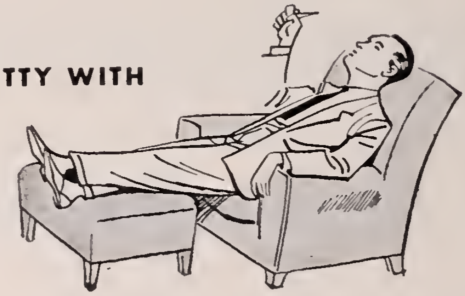
If I need My Money, Can I sell my Municipal Bonds?

The answer is, *Yes*. While most investors keep their Municipal Bonds to maturity, occasionally some investors for various reasons sell some bonds before maturity. There are over 900 security dealers throughout the United States who handle Municipal Bonds. It is not generally known that daily volume in Municipal Bond trading and selling exceeds that of corporate bond trading on the New York Stock Exchange. It is generally known, however, that *Municipal Bonds make excellent collateral for temporary bank loans.*

Any fluctuations in Municipal Bond prices are very moderate since they generally reflect the condition of the money market. This market is normally tied to the prices paid for United States Government Bonds. While there is some fluctuation in the prices of all securities, historically, Municipal Bonds have been among the investments experiencing the least fluctuation.

Reprinted from "Municipal Bonds and You" our colorful sixteen-page book that is available to you Free!

YOU WILL BE SITTING PRETTY WITH MUNICIPAL BONDS



Name____
Address______________________________________
City________________________ State________
MM-9-6

JURAN & MOODY, INC.

Municipal Bonds Exclusively

Rand Tower
MINNEAPOLIS 2

93 East 6th St.
ST. PAUL 1
TELEPHONE: CApital 4-9661

Citizens and Southern Building
ATLANTA, GA.

broad-spectrum therapy as good as it tastes!

TETRABON*

BRAND OF TETRACYCLINE **HOMOGENIZED MIXTURE**

125 mg. tetracycline per 5 cc. teaspoonful. Bottles of 2 fl. oz. and 1 pint, packaged ready to use (no reconstitution required). READILY ACCEPTED delightfully different fruit flavor . . . RAPIDLY ABSORBED fine particle dispersion—therapeutic blood levels within one hour . . . QUICKLY EFFECTIVE well-tolerated tetracycline for prompt control of a wide range of infections.

*Trademark

PFIZER LABORATORIES
Division, Chas. Pfizer & Co., Inc.
Brooklyn 6, N.Y.

Pfizer

HERE'S WHY SO MANY DOCTORS NOW SMOKE AND RECOMMEND

VICEROY

Microscopic analysis shows the Viceroy tip has...
20,000 FILTERS

Twice as Many Filters
AS THE OTHER TWO LARGEST-SELLING FILTER BRANDS
For the Smoothest Taste in Smoking!

COMPARE! HOW MANY FILTERS IN YOUR FILTER TIP? (REMEMBER—THE MORE FILTERS THE SMOOTHER THE TASTE!)

Viceroy
TWICE AS MANY FILTERS
Brand B
Only HALF the FILTERS
Brand C
LESS than HALF the FILTERS

VICEROY'S EXCLUSIVE FILTER IS MADE FROM PURE CELLULOSE—SOFT, SNOW-WHITE, NATURAL!

TWENTY
VICEROY
Filter Tip
CIGARETTES
KING-SIZE

For
Control
of
Acute
Agitation

- In the acute alcoholic
- In the acute psychotic
- In the drug addict

A potent new agent in chemopsychotherapeutics, SPARINE has demonstrated a marked ability to calm and relax acutely agitated patients.[1,2] Without inducing disabling lethargy or dulling perception, SPARINE "... is effective in ... maintaining these subjects in a quiescent detached state. ..."[1]

Given intravenously, SPARINE rapidly brings patients under control. Given orally or intramuscularly, it promotes patient accessibility, fosters psychotherapeutic contact, and facilitates over-all management. Parenteral administration of SPARINE is not painful and does not cause tissue necrosis at the site of injection.

For intravenous, intramuscular, or oral administration

1. Fazekas, J.F., et al.: J.A.M.A. **161**:46 (May 5) 1956. 2. Mitchell, E.H.: J.A.M.A. **161**:44 (May 5) 1956.

NEW Potent Ataractic Drug

S

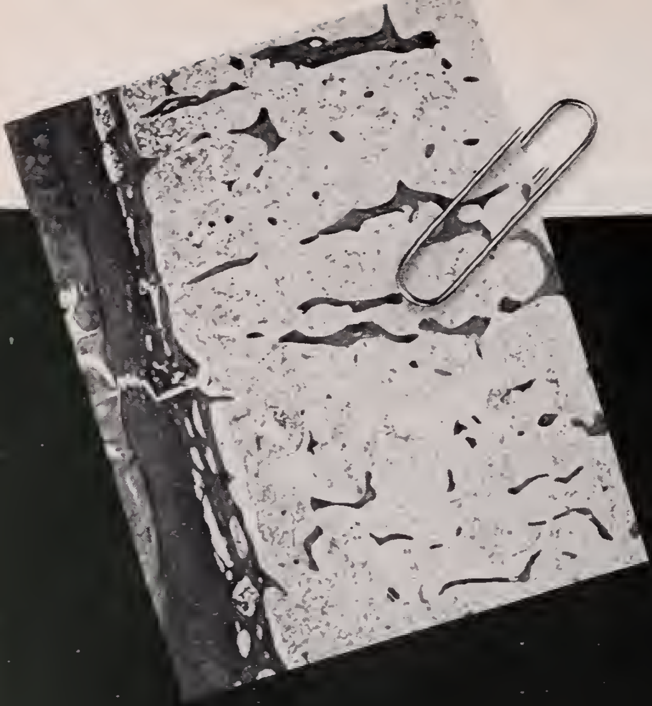
Sparine* Hydrochloride

Promazine Hydrochloride

10-(γ-dimethylamino-*n*-propyl)-phenothiazine hydrochloride

*Trademark

Wyeth®
Philadelphia 1, Pa.



when bones begin
to show signs
of change

GYNETONE REPETABS

for osteoporosis of
- menopause
- postmenopause
- senility
- arthritis
- long-term ACTH, cortisone and hydrocortisone therapy

Combined estrogen-androgen therapy with GYNETONE REPETABS stimulates protein synthesis to improve bone-building action and to enhance calcium redeposition* with minimal side effects of either hormone.

---

*Reifenstein, E. C., Jr., and Albright, F.: J. Clin. Investigation *26*:24, 1947.

for individualized therapy: two strengths

GYNETONE REPETABS ".02": Ethinyl Estradiol U.S.P. 0.02 mg. plus 5 mg. Methyltestosterone U.S.P.
GYNETONE REPETABS: ".04": Ethinyl Estradiol U.S.P. 0.04 mg. plus 10 mg. Methyltestosterone U.S.P.

GYNETONE,® combined estrogen-androgen.
REPETABS,® Repeat Action Tablets. GT-63-256

SCHERING

Schering
GYNETONE
REPETABS
SCHERING

unchanged life

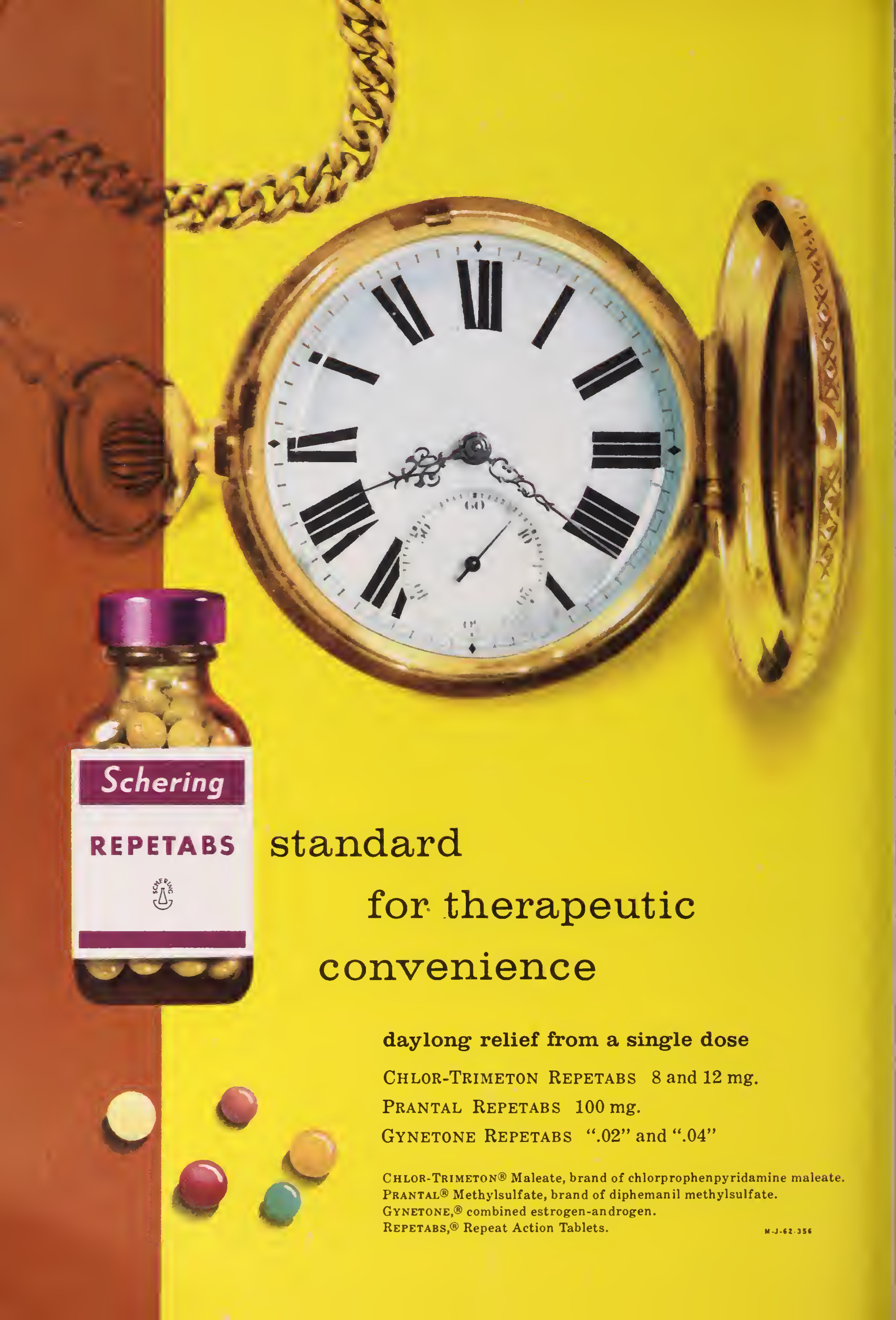
in the changing years

two strengths

0.02 mg. ethinyl estradiol plus 5 mg. Methyltestosterone U.S.P.
0.04 mg. ethinyl estradiol plus 10 mg. Methyltestosterone U.S.P.

GYNETONE,® combined estrogen-androgen.
REPETABS,® Repeat Action Tablets.

GT-J-61-256



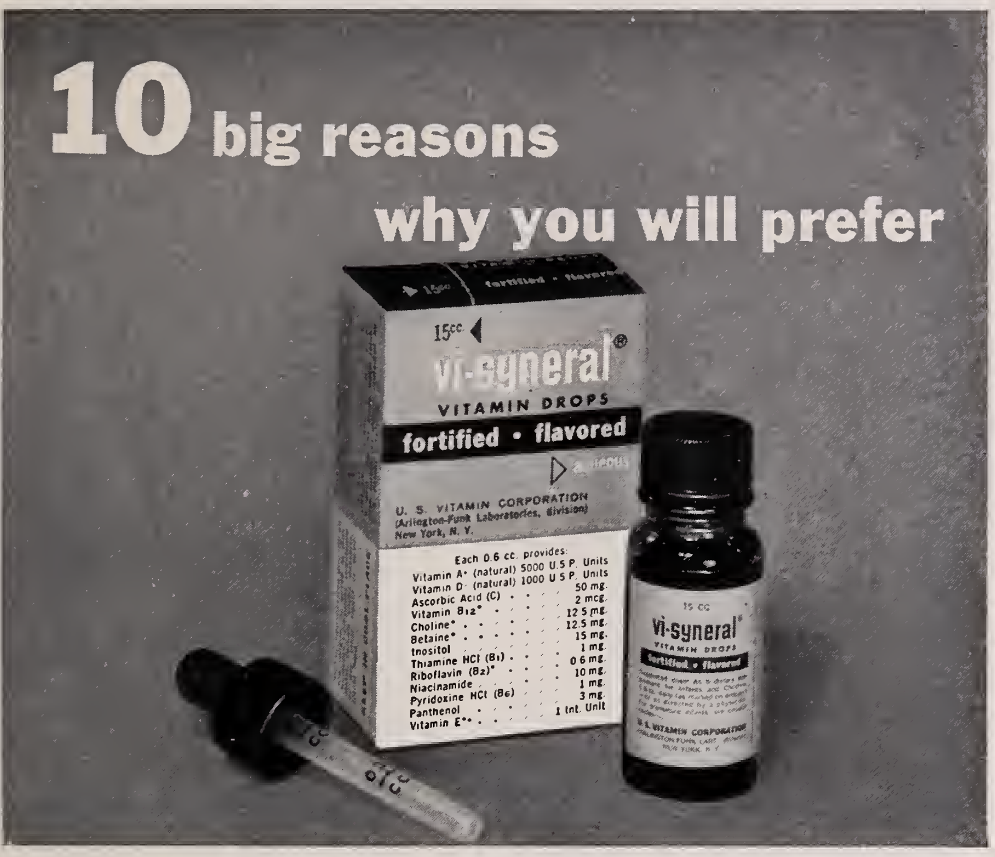
standard for therapeutic convenience

daylong relief from a single dose

CHLOR-TRIMETON REPETABS 8 and 12 mg.
PRANTAL REPETABS 100 mg.
GYNETONE REPETABS ".02" and ".04"

CHLOR-TRIMETON® Maleate, brand of chlorprophenpyridamine maleate.
PRANTAL® Methylsulfate, brand of diphemanil methylsulfate.
GYNETONE,® combined estrogen-androgen.
REPETABS,® Repeat Action Tablets.

M-J-62-356


10 big reasons
why you will prefer
15cc
vi-syneral®
VITAMIN DROPS
fortified · flavored
U. S. VITAMIN CORPORATION
(Arlington-Funk Laboratories, division)
New York, N. Y.
Each 0.6 cc. provides:
Vitamin A* (natural) 5000 U.S.P. Units
Vitamin D* (natural) 1000 U.S.P. Units
Ascorbic Acid (C) 50 mg.
Vitamin B12* 2 mcg.
Choline* 12.5 mg.
Betaine* 12.5 mg.
Inositol 15 mg.
Thiamine HCl (B1) 1 mg.
Riboflavin (B2)* 0.6 mg.
Niacinamide 10 mg.
Pyridoxine HCl (B6) 1 mg.
Panthenol 3 mg.
Vitamin E** 1 Int. Unit
15 cc
vi-syneral®
VITAMIN DROPS
fortified · flavored
U. S. VITAMIN CORPORATION

vi-syneral vitamin drops fortified

1. provides growth-promoting, appetite-stimulating vitamin B_{12}.

2. lipotropic agents to aid fat and carbohydrate metabolism.

3. 100% natural vitamin A complex better utilized in the visual process.

4. 100% natural vitamin D complex for superior protection against rickets and dental defects.

5. vitamin E for muscle tone.

6. vitamins A, D, and E made aqueous* for far faster and more complete absorption and utilization.

7. vitamin B_6...anticonvulsant vitamin.

8. other essential B complex factors and vitamin C.

9. delicious fruity flavor.

10. no burps...no fish oil taste or odor...allergens removed.

*Protected by U.S. Pat. No. 2,417,299 owned and controlled by U.S. Vitamin Corporation

SAMPLES of new VI-SYNERAL VITAMIN DROPS FORTIFIED on request

u.s. vitamin corporation · PHARMACEUTICALS
(Arlington-Funk Laboratories, division) • 250 East 43rd St., New York 17, N.Y.

Introducing

A.P.C. WITH Demerol® Tablets

for more efficient

CONTROL OF *Pain*

Each tablet contains:

Aspirin	200 mg.	(3 grains)
Phenacetin	150 mg.	(2½ grains)
Caffeine	30 mg.	(½ grain)
Demerol hydrochloride	30 mg.	(½ grain)

Average Adult Dose: 1 or 2 tablets repeated in three or four hours as needed.

Bottles of 100 tablets. *Narcotic blank required.*

"Such a combination has proven clinically to be far more effective and no more toxic than equivalent doses of any of these used singly."*

Winthrop LABORATORIES
NEW YORK 18, N. Y.

*Bonica, J.J.; and Backup, P.H.: Northwest Med., 54:22, Jan. 1955.

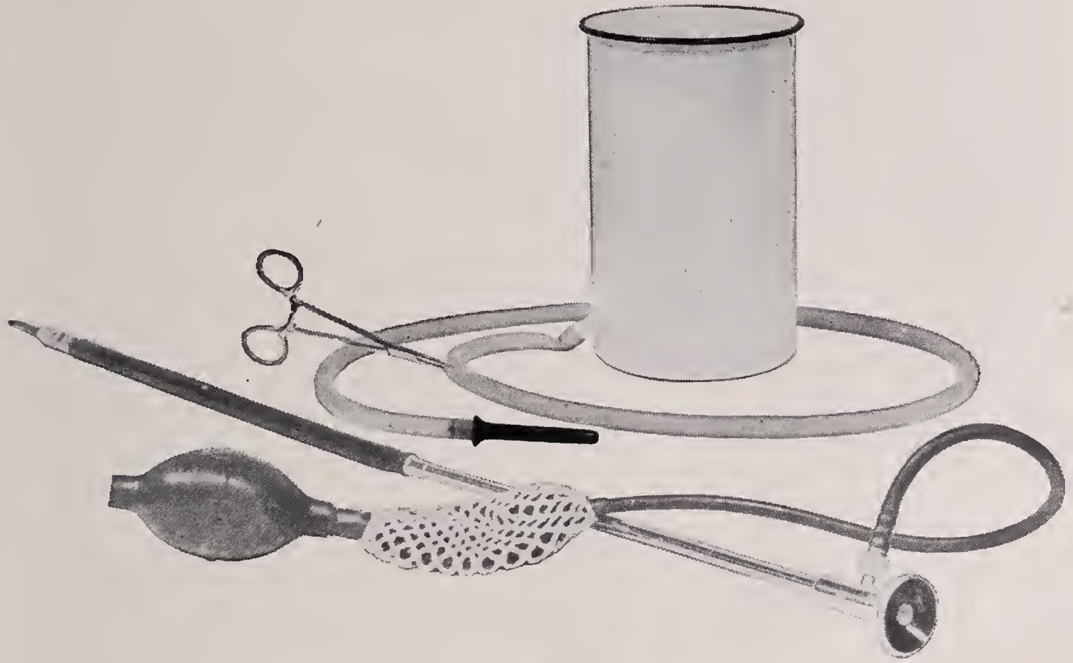
Demerol, trademark reg. U.S. Pat. Off., brand of meperidine, – May be habit forming

. . . part of *every illness*

ANXIETY

is part of

GASTROINTESTINAL DISORDERS



In every patient . . .
a valuable adjunct
to the customary therapy

Supplied: Tablets, 400 mg., bottles of 50.
Usual Dose: 1 tablet, t.i.d.

Wyeth
®
Philadelphia 1, Pa.

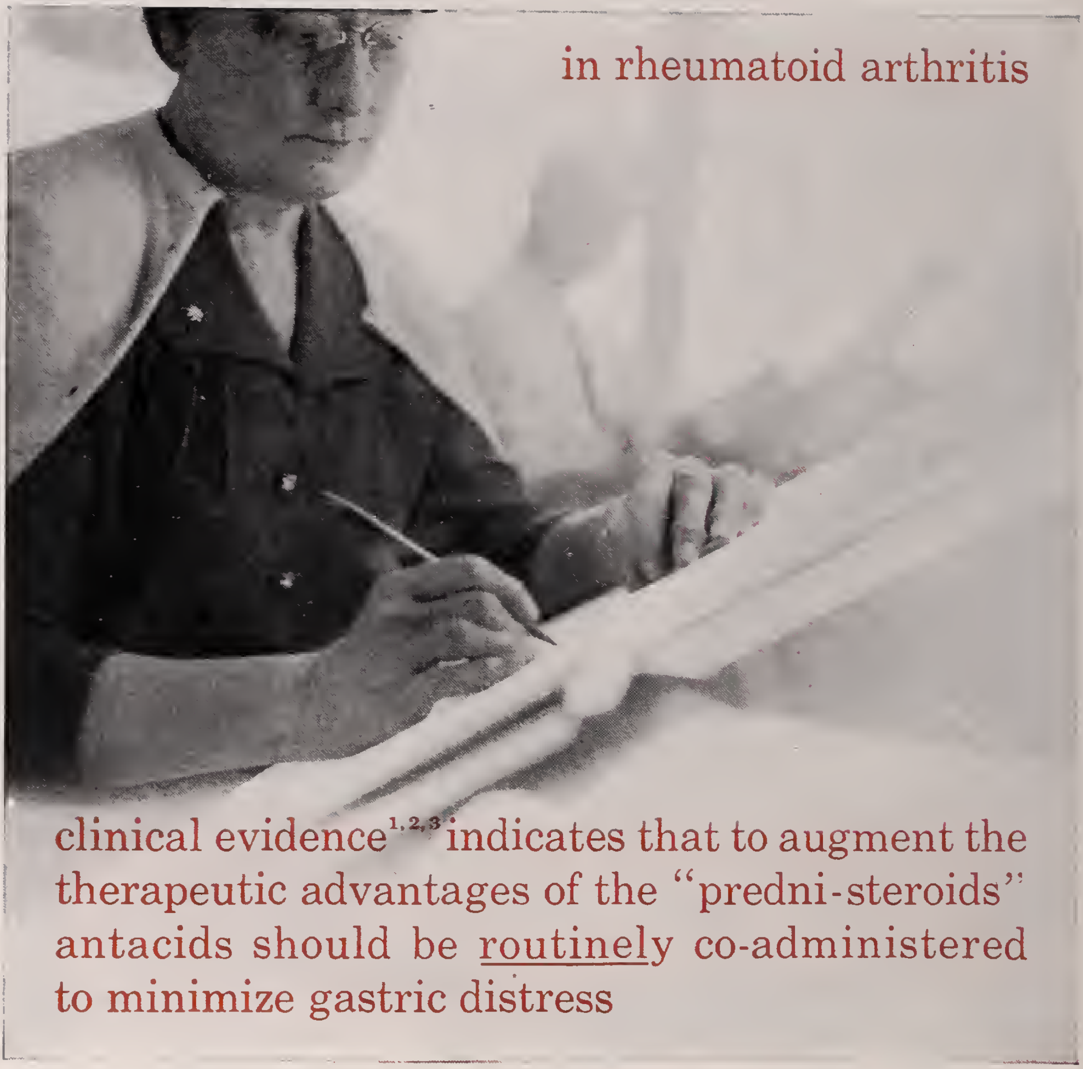
Equanil*

MEPROBAMATE

(2-methyl-2-*n*-propyl-1,3-propanediol dicarbamate)
Licensed under U.S. Patent No. 2,724,720

*Trademark

anti-anxiety factor with muscle-relaxing action



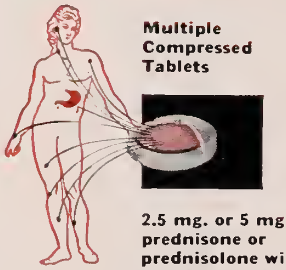
in rheumatoid arthritis

clinical evidence[1,2,3] indicates that to augment the therapeutic advantages of the "predni-steroids" antacids should be routinely co-administered to minimize gastric distress

ROUTINE CO-ADMINISTRATION MEANS

'Co-Hydeltra'

(Prednisolone Buffered)



Multiple Compressed Tablets

2.5 mg. or 5 mg. prednisone or prednisolone with 50 mg. magnesium trisilicate and 300 mg. aluminum hydroxide gel.

'Co-Deltra'

(Prednisone Buffered)

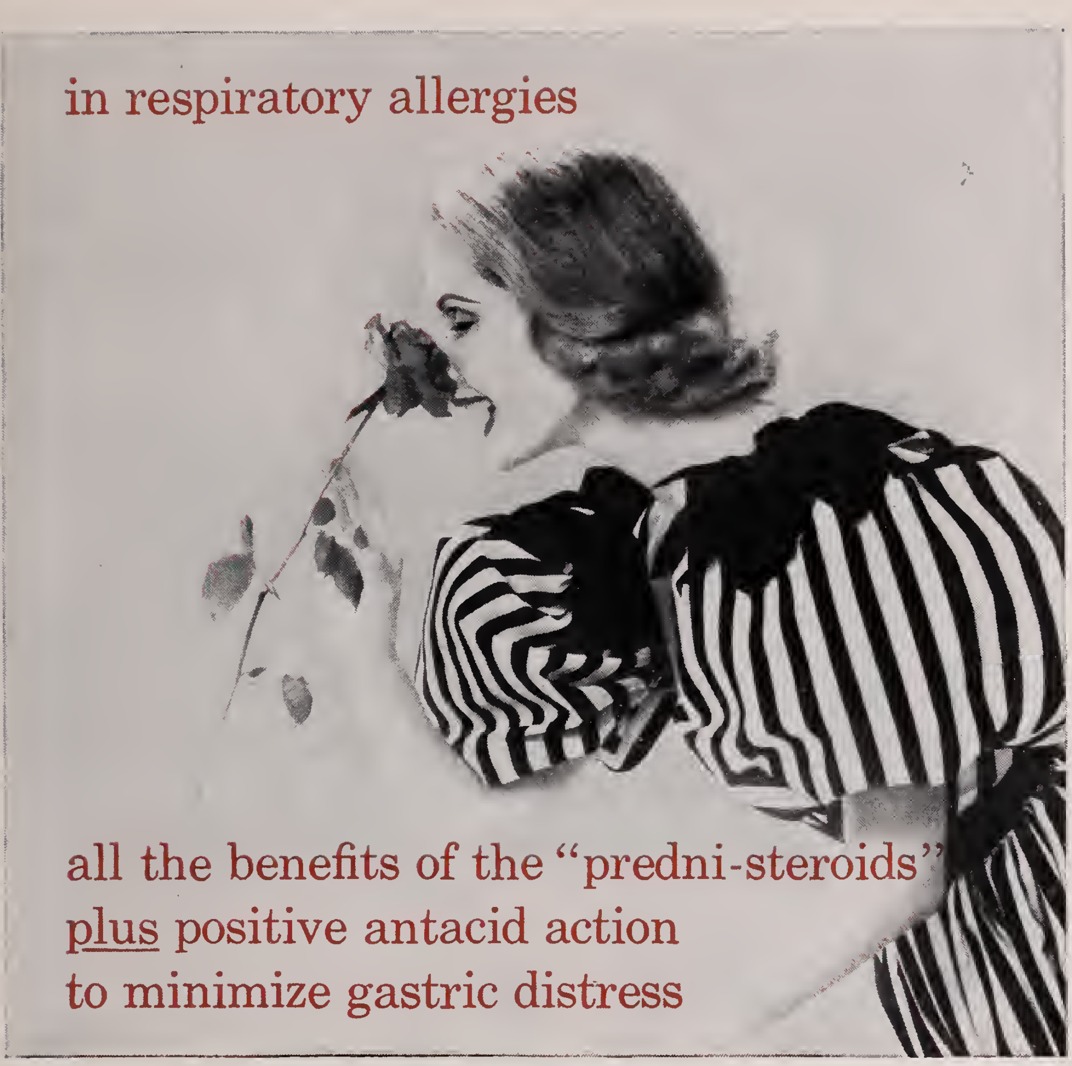
All the benefits of the "predni-steroids" plus positive antacid action to minimize gastric distress.

References: 1. Boland, E. W., *J.A.M.A.* 160:613 (February 25) 1956. 2. Margolis, H. M. *et al.*, *J.A.M.A.* 158:454 (June 11) 1955. 3. Bollet, A. J. *et al.*, *J.A.M.A.* 158:459 (June 11) 1955.

MSD

MERCK SHARP & DOHME
DIVISION OF MERCK & CO., INC.
PHILADELPHIA 1, PA

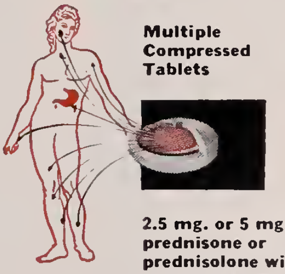
'CO-DELTRA' *and* 'CO-HYDELTRA' *are trademarks of* MERCK & CO., INC.


in respiratory allergies
all the benefits of the "predni-steroids"
plus positive antacid action
to minimize gastric distress

ROUTINELY ACHIEVED WITH

'Co-Deltra'

(Prednisone Buffered)



Multiple Compressed Tablets

'Co-Hydeltra'

(Prednisolone Buffered)

Clinical evidence[1,2,3] indicates that to augment the therapeutic advantages of prednisone and prednisolone, antacids should be *routinely* co-administered to minimize gastric distress.

2.5 mg. or 5 mg. prednisone or prednisolone with 50 mg. magnesium trisilicate and 300 mg. aluminum hydroxide gel.

References: 1. Boland, E. W., *J.A.M.A.* 160:613 (February 25) 1956. 2. Margolis, H. M. *et al.*, *J.A.M.A.* 158:454 (June 11) 1955. 3. Bollet, A. J. *et al.*, *J.A.M.A.* 158:459 (June 11) 1955.

MSD

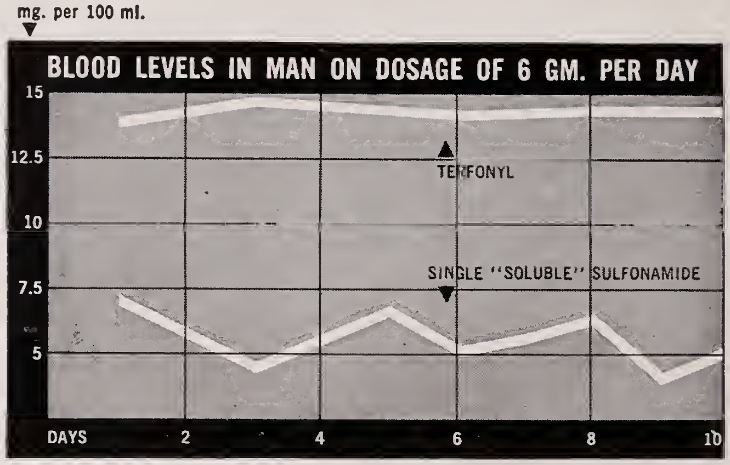
MERCK SHARP & DOHME
DIVISION OF MERCK & CO., INC.
PHILADELPHIA 1, PA.

'CO-DELTRA' *and* 'CO-HYDELTRA' *are trademarks of* MERCK & CO., INC.

maximum efficacy with minimum risk

Terfonyl

SQUIBB METH-DIA-MER SULFONAMIDES



– After Lehr, D., Modern Med. 23:111 (Jan. 15) 1955.

Terfonyl is absorbed as well as single "soluble" sulfonamides, but is eliminated at a slower rate. For this reason, Terfonyl blood levels are much higher.

In experimental infections (Klebsiella, Pneumococcus, Streptococcus), Meth-Dia-Mer sulfonamides have been shown to be from three to four times more effective on a weight basis than single "soluble" sulfonamides.

Toxicity is minimal because normal dosage provides only one-third the normal amount of each sulfonamide. The body handles each component as though it were present alone, although therapeutic effects are additive.

Terfonyl Tablets, 0.5 Gm., bottles of 100 and 1000.
Terfonyl Suspension, 0.5 Gm. per 5 ml., pint bottles.

0.167 Gm. each of sulfamethazine, sulfadiazine and sulfamerazine per tablet or per 5 ml. teaspoonful of suspension.

SQUIBB

'TERFONYL'® IS A SQUIBB TRADEMARK

Upjohn

Rheumatoid arthritis, rheumatic fever, intractable asthma, allergies . . .

Cortef* *tablets*

Supplied:

5 mg. tablets in bottles of 50
10 mg. tablets in bottles of 25, 100, 500
20 mg. tablets in bottles of 25, 100, 500

*REGISTERED TRADEMARK FOR THE UPJOHN BRAND OF HYDROCORTISONE (COMPOUND F)

The Upjohn Company, Kalamazoo, Michigan

25 Compressed Tablets
Cortef*, 20 mg.
TRADEMARK, REG. U.S. PAT. OFF.
Brand of hydrocortisone
Each tablet contains
20
The Upjohn Company
Kalamazoo, Michigan

A MODERN PRIVATE SANITARIUM
for the Diagnosis, Care and Treatment of Nervous and Mental Disorders

MAIN BUILDING—One of 10 Units in "Cottage Plan"

ST. CROIXDALE ON LAKE ST. CROIX

PRESCOTT, WISCONSIN

Located on beautiful Lake St. Croix, 18 miles from the Twin Cities, it has the advantages of both City and Country. Every facility for treatment provided, including recreational activities and occupational-therapy under trained personnel. Close personal supervision given patients, and modern methods of therapy employed. Inspection and cooperation by reputable physicians invited. Rates very reasonable. Illustrated folder on request.

Prescott Office
Prescott, Wisconsin
Howard J. Laney, M.D.
Tel. 39 and Res., 76

Consulting Neuro-Psychiatrists
Hewitt B. Hannah, M.D., Andrew J. Leemhuis, M.D.
527 Medical Arts Bldg., Tel. FE. 2-1357, Minneapolis, Minn.

Superintendent
Ella M. Leseman
Prescott, Wisconsin
Tel. 69

for your complete insurance needs . . .

☆ PROFESSIONAL
☆ PERSONAL
☆ PROPERTY

CHOICE OF THE MINNESOTA MEDICAL ASSOCIATION FOR PROFESSIONAL LIABILITY INSURANCE

ST. PAUL FIRE AND MARINE CO • ST. PAUL MERCURY INDEMNITY CO • MERCURY INSURANCE CO •
The Saint Paul Companies
SINCE 1853
INSURANCE
LAND • SEA • AIR

THERE IS A SAINT PAUL AGENT IN YOUR COMMUNITY
AS CLOSE AS YOUR PHONE

HOME OFFICE: 111 WEST FIFTH STREET, SAINT PAUL 2, MINNESOTA

recognized

as a potent, specific anti-arthritic

established

by over 100 million patient days

substantiated

in more than 700 published reports

BUTAZOLIDIN®

(phenylbutazone GEIGY)

potent, specific anti-arthritic

Based on an impressive background of achievement attained over a period of four years involving both long-term and short-term therapy in all the major forms of arthritis, BUTAZOLIDIN is recognized as one of the most effective anti-arthritic agents currently available.

relieves pain

improves function

resolves inflammation

BUTAZOLIDIN being a potent therapeutic agent, physicians unfamiliar with its use are urged to send for literature before prescribing it.

GEIGY

GEIGY PHARMACEUTICALS, Division of Geigy Chemical Corporation, New York 13, N. Y.

72556

A more complete gall bladder regimen in a single tablet...

Colicell

Each Tite-Coat Red Tablet Contains:

Extracts of Whole Bile (Equal parts Ox and Hog)	210.0 mg.
Ketocholanic Acids (Oxidized or keto form of normally occurring bile acids containing approximately 93% dehydrocholic acid)	90.0 mg.
Methyl Cellulose	130.0 mg.
Homatropine Methylbromide	2.5 mg.

(In bottles of 100 and 1000 tablets.)

- *more effective . . . for a longer period of time*
- *specially coated to prevent gastric disturbance*
- *lower cost than most bile acid preparations that have only a single purpose*

SINCE 1883

SAMPLES AND LITERATURE ON REQUEST
SUTLIFF & CASE CO., INC.
Pharmaceutical Specialties
PEORIA, ILLINOIS

For the doctor who must do his own dispensing

Professional Suite
OPHTHALMIC EQUIPMENT AND FURNITURE

Master Styling Room Ensemble

● Today's eye doctor must satisfy the growing demand of his patients for fashion, style and service. And at the same time, in the interest of more successful operation, he must increase his own efficiency.

After several years of research and study under actual operating conditions, PROFESSIONAL SUITE presents this matched line of equipment and furniture — *specifically designed and engineered for the modern styling and dispensing rooms of modern doctors* ... sold in matched ensembles for large, medium and smaller offices. Individual pieces may also be purchased.

For further information on color, price, etc., discuss PROFESSIONAL SUITE with your supplier or send for this illustrated catalog.

Professional Suite

P. O. BOX 65
MINNEAPOLIS, MINN.

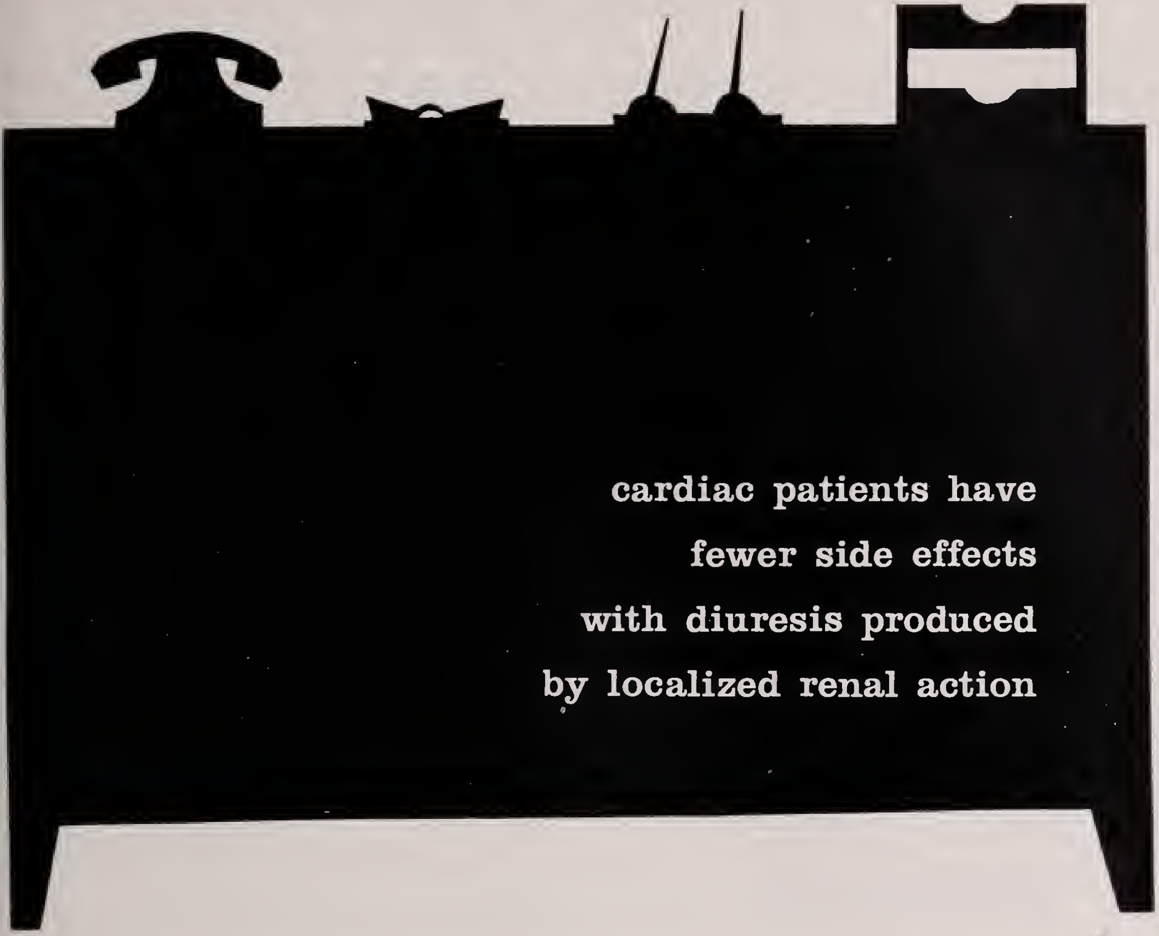
Professional Suite, P. O. Box 65, Minneapolis, Minn.

I'd like to take a look at your PROFESSIONAL SUITE catalog *(no obligation, of course).* Dept. No. MM96

Name____________________

Address____________________

City____________Zone____State______


cardiac patients have
fewer side effects
with diuresis produced
by localized renal action

PATIENTS IN FAILURE NEED AN ORGANOMERCURIAL

When acidosis is the diuretic mechanism, as with the carbonic anhydrase inhibitors and acidifying salts, widespread effects on many organs can be anticipated.
In contrast, the dependable diuresis produced by the organomercurials—resulting from enzyme inhibition localized in the kidney—avoids these extrarenal effects.

TABLET

NEOHYDRIN®

BRAND OF CHLORMERODRIN (18.3 MG. OF 3-CHLOROMERCURI-2-METHOXY-PROPYLUREA EQUIVALENT TO 10 MG. OF NON-IONIC MERCURY IN EACH TABLET)

a standard for initial control of severe failure

MERCUHYDRIN® SODIUM
BRAND OF MERALLURIDE INJECTION

LAKESIDE

02656

MONODRAL® WITH MEBARAL®

psychovisceral
stabilizer

ANTICHOLINERGIC • SEDATIVE

in peptic ulcer management

- **relieves pain promptly**
- **reduces tension safely**
- **tranquilizes without dulling**
- **well tolerated**
- **promotes healing**
- **maintains anacidity for hours**
- **controls hyperactivity of upper gastro-intestinal tract**

Monodral with Mebaral—the "psychovisceral stabilizer"—provides for patients with ulcer and gastro-intestinal spasm an effective barrier against the impact of environmental stimuli . . . controls gastric hypersecretion and hypermotility for three and one half to five hours.*

EACH TABLET CONTAINS:
Monodral bromide..... 5 mg.
Mebaral.............32 mg.

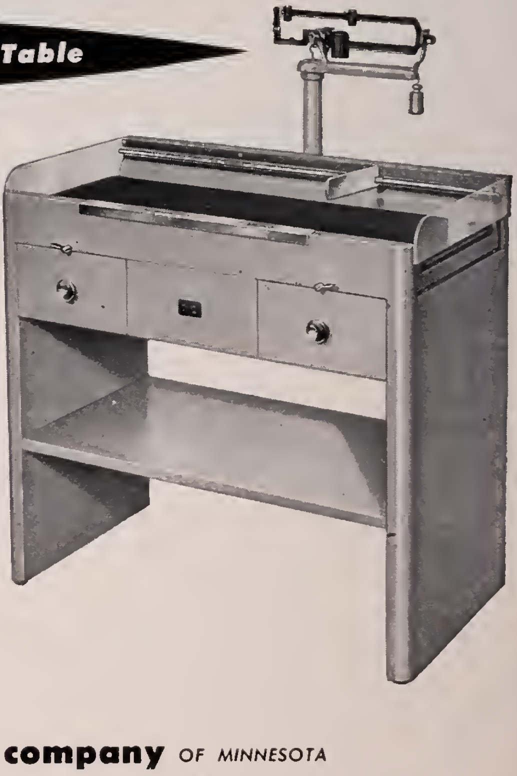
DOSAGE: 1 or 2 tablets three or four times daily.
Available on prescription only.
Bottles of 100 tablets.

Winthrop Laboratories New York 18, N. Y.

Monodral (brand of penthienate) and Mebaral (brand of mephobarbital), trademarks reg. U. S. Pat. Off.
References and clinical trial supplies available on request.

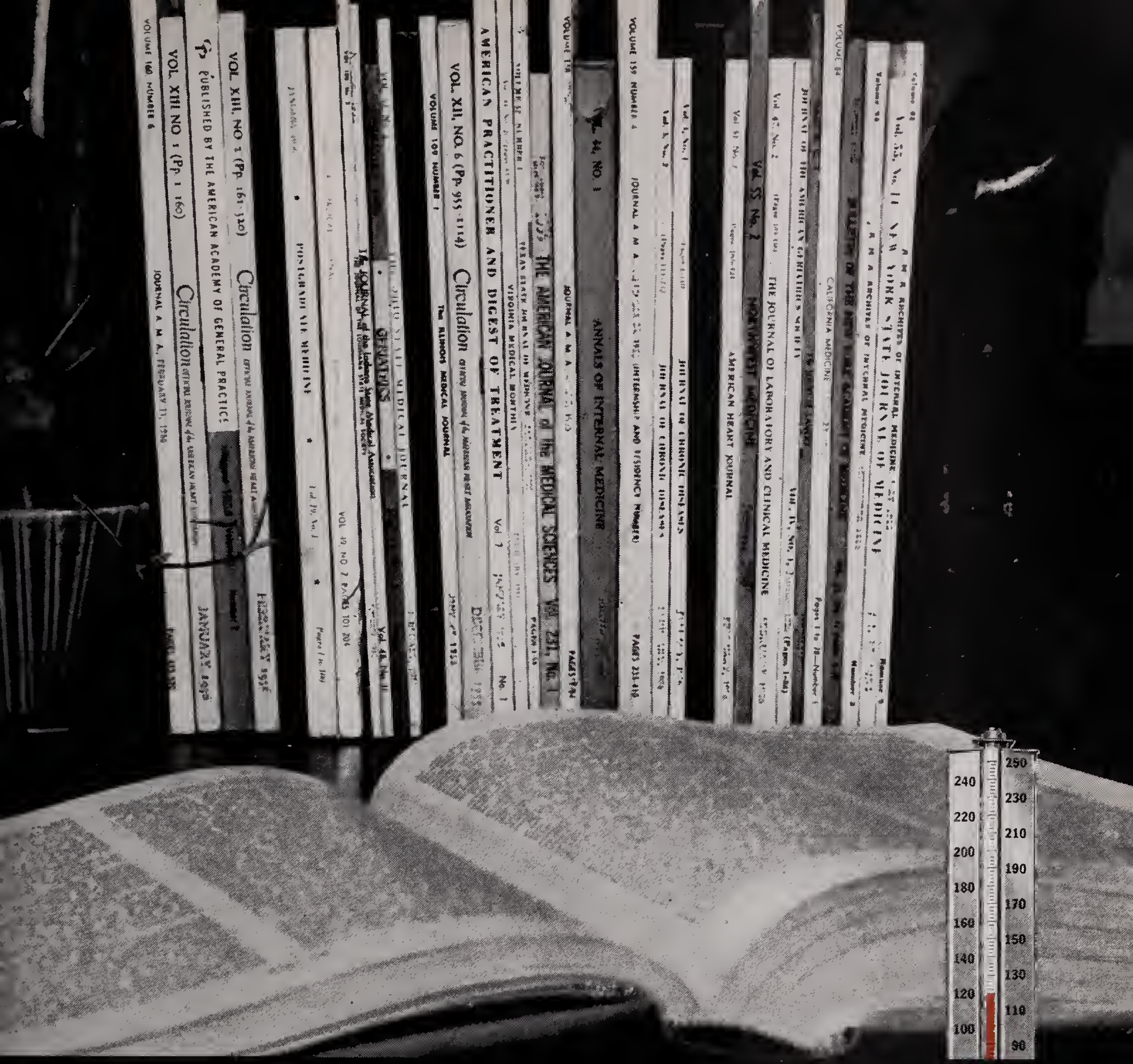
New STEELINE Pediatric Table

Eases the burden of the physician's daily work



Includes built-in tare balance scale, built-in measuring rod, foam rubber cushion and electrical outlets with cord and plug—there are no accessories to buy. Top quality construction features include all-welded steel body, two roomy drawers and a large open compartment with shelf, providing easy, unhampered access to instruments and supplies. Front edge is protected from wear by a stainless steel baffle plate. Despite the fact that this new table has been designed to provide the physician with the best modern equipment, efficient modern production methods in our own factory permit us to keep the price well below that of comparable models. Write today for complete information.

a. s. aloe company OF MINNESOTA
927 Portland Avenue, Minneapolis 4, Minn. • Phone:


Circulation
PUBLISHED BY THE AMERICAN ACADEMY OF GENERAL PRACTICE
POSTGRADUATE MEDICINE
GERIATRICS
AMERICAN PRACTITIONER AND DIGEST OF TREATMENT
VIRGINIA MEDICAL MONTHLY
THE AMERICAN JOURNAL of the MEDICAL SCIENCES
ANNALS OF INTERNAL MEDICINE
JOURNAL OF CHRONIC DISEASES
AMERICAN HEART JOURNAL
NORTHWEST MEDICINE
THE JOURNAL OF LABORATORY AND CLINICAL MEDICINE
CALIFORNIA MEDICINE
NEW YORK STATE JOURNAL OF MEDICINE
A M A ARCHIVES OF INTERNAL MEDICINE
240
220
200
180
160
140
120
100
250
230
210
190
170
150
130
110
90

From the Literature

"... the most effective antihypertensive agent available."[1]

"... a simple and safe regimen for the ambulatory management of hypertensive patients."[2]

"... reduction of the blood pressure may be achieved in substantially all forms of hypertension."[3]

"... possible in most patients to get a good control over blood pressure levels with comparatively few side-effects."[4]

"... significant falls ... occurred in systolic and diastolic blood pressure. ... The cardiac, retinal and coronary status of all patients was improved."[5]

1. Moser, M.: New York State J. Med. **55**:1999 (July 15) 1955. 2. Agrest, A., and Hoobler, S.W.: J.A.M.A. **157**:999 (March 19) 1955. 3. Smirk, F.H.: Am. J. Med. **17**:839 (Dec.) 1954. 4. Smirk, F.H., and McQueen, E.G.: J. Chron. Dis. **1**:516 (May) 1955. 5. Waldman, S., and Pelner, L.: Am. J. M. Sc. **231**:140 (Feb.) 1956.

ANSOLYSEN®
TARTRATE
Pentolinium Tartrate
Lowers Blood Pressure

Wyeth®
Philadelphia 1, Pa.

new dimensions in the treatment of seve

broadens benefits

- rapid control of allergic sneezing, lacrimation, nasal congestion; relief of pruritus, edema and erythema
- up to 5 times more effective than oral hydrocortisone, milligram for milligram

narrows side effects

- minimizes incidence of fluid and electrolyte disturbance
- dietary regulation usually unnecessary

lengthens established gains

- permits a smoother, undisturbed regimen
- extends and maintains benefits to more patients

y fever and other difficult allergies...

METICORTEN
(PREDNISONE)

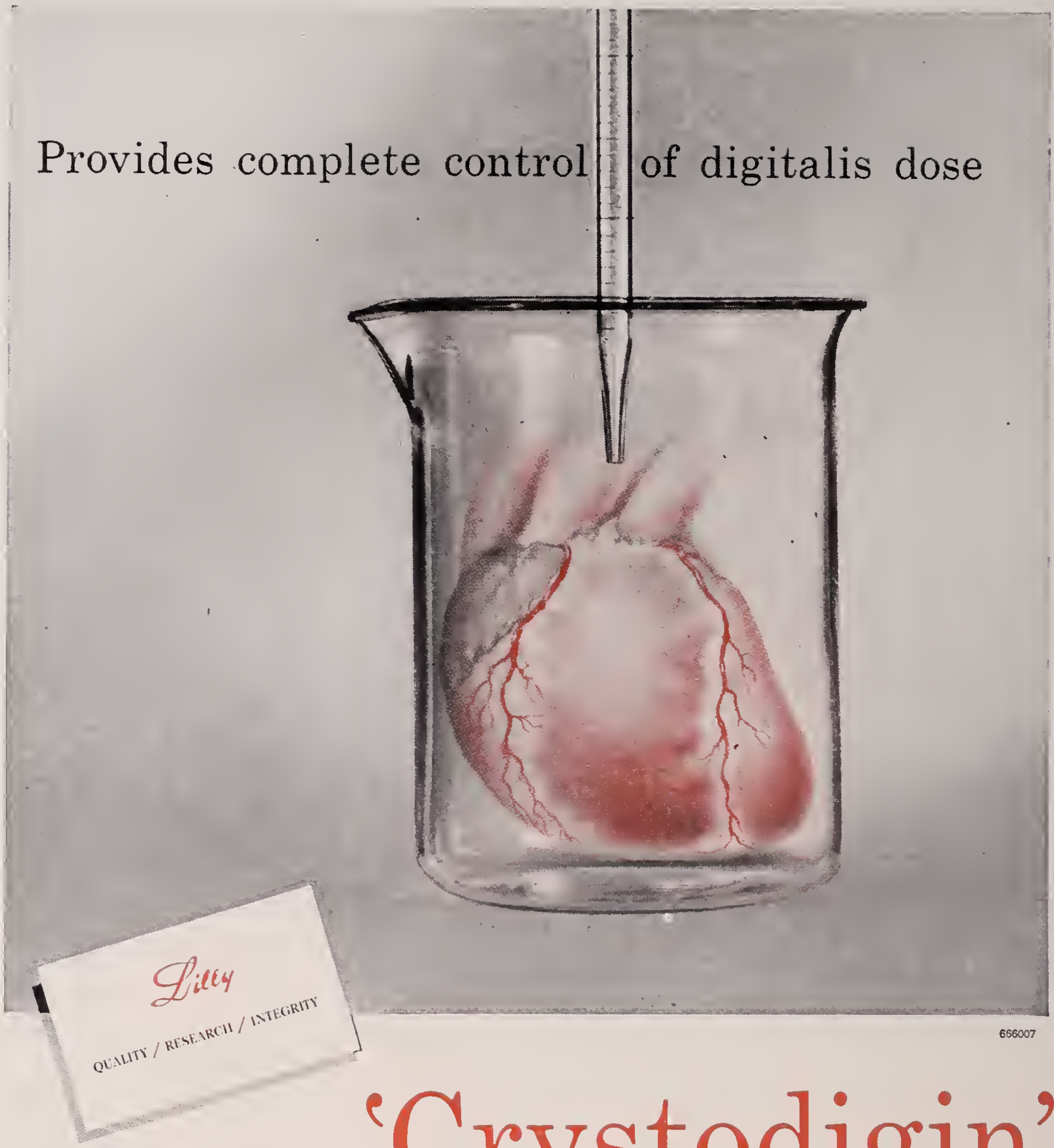
or outstanding hormonal control
ith minimal electrolyte disturbances

n hay fever and other respiratory allergies,
contact dermatitis and allergic eczemas,
drug and other allergic reactions,
allergic and inflammatory eye disorders

METICORTEN,* brand of prednisone.
1, 2.5 and 5 mg. tablets. *T.M.
MC-J-3086

Schering

Schering
METICORTEN
PREDNISONE
SCHERING


Provides complete control of digitalis dose
Lilly
QUALITY / RESEARCH / INTEGRITY
666007

‘Crystodigin’

(CRYSTALLINE DIGITOXIN, LILLY)

. . . . permits accurate dosage titration to produce the maximum therapeutic effect

Available in scored tablets of 0.05 mg. (orange), 0.1 mg. (pink), 0.15 mg. (yellow), and 0.2 mg. (white); and in 1-cc. and 10-cc. ampoules, 0.2 mg. per cc.

Since initial digitalization and maintenance dosage must be carefully individualized, ‘Crystodigin’ fulfills the important requirements of a preferred digitalis. ‘Crystodigin’ is a crystalline-pure, uniformly potent single glycoside that is completely absorbed in the gastro-intestinal tract. With ‘Crystodigin,’ the maximum therapeutic effect can be safely determined by dosage titration in increments as small as 0.025 mg.

80TH ANNIVERSARY 1876 · 1956 / ELI LILLY AND COMPANY

Original Contributions

Metabolic Relationships of Potassium, Nitrogen and Sodium

PAUL R. CANNON, M.D.
Chicago, Illinois

AN adequate consideration of the metabolic activities of any one of the three elements comprising the title of this discourse would obviously require more time than that allotted for the present Arthur H. Sanford Memorial Lecture. The inclusion of all three of them, therefore, may merely represent a case of poor judgment. Nevertheless, the attempt will be made to outline, even though briefly, some of the more important relationships of these elements, with particular emphasis upon a few aspects of special clinical concern at the present time.

Let us first consider a few significant facts about potassium. As Fenn has said,[1] "Potassium is remarkable as the only ion of physiological importance which has a naturally occurring radioactive isotope, K^{40}. This isotope further on disintegration gives off beta rays and turns into calcium or gives off gamma rays and a positron and turns into argon. From the amounts of these substances the original amount of K^{40} can be calculated, as well as the age of the earth. With the original amount present there was enough heat from the higher rate of disintegration to keep the earth in a fluid state. Thus potassium is responsible for the formation of its own physiological antagonist, calcium, and has played an important role in the geological history of the earth. Potassium is also remarkable as the essential intracellular ion. As such the exchangeable potassium of the soil is essential currency for the growth of plants, and high potassium foods are essential for the growth of animals." Potassium is also known to be indispensable for muscle contraction, including cardiac muscle, for nerve action, for glycogen formation, and for certain intracellular enzymatic actions concerned with energy release. For example, phosphocreatine in muscle exists as a di-potassium salt, thus evidencing the relationship of potassium to the formation and function of the high-energy phosphate bonds which are so important in cellular metabolism. It has been estimated from balance studies that in a healthy adult human subject the daily turnover of potassium is about one gram, and that, on the average, the potassium content of all tissues is about 150 grams, of which approximately 115 grams are in muscle, 8 grams in the blood, 4 grams in the skin, 3 grams in the extracellular fluid, and only about 300 milligrams in the circulating plasma.

Since the development of the flame photometer increasing numbers of clinical conditions have been shown to be associated with hypokalemia, and potassium deficiency has become a dominant problem in many clinical situations. Thus in a survey of more than a thousand patients in which the plasma potassium levels were obtained, Ellison and associates[2] found abnormally low levels in approximately 20 per cent, with about 6 per cent showing values below 3 mEq/L., most of the latter in surgical patients. Danowski[3] has recently outlined the usual ways in which hypokalemia develops, viz.: (1) From increase by dilution of the extracellular fluid volume; (2) from transfer of potassium from the extracellular fluid to cells; and (3) from the loss of potassium from both cells and extracellular fluid. In the first category, hypokalemia may result from a too-copious administration of potassium-free fluids, with a consequent imbalance of potassium ion between cells and tissue fluids. Such a dilution type of hypokalemia can be prevented by limitation of water intake or by the use of better balanced fluids for hydration purposes. Hypokalemia may also result from the migration of potassium ions from extracellular fluid into cells, as, for example, under anabolic conditions of cellular growth and repair, during the use of testosterone, from dehy-

---

From the Department of Pathology, University of Chicago, Chicago, Illinois.

Presented at the annual meeting of the Minnesota State Medical Association, Rochester, Minnesota, May 21, 1956.

dration, acidosis, familial periodic paralysis, or from excessive use of glucose solutions and insulin, with a resulting increased formation of glycogen. Probably the most common causes of hypokalemia, and of potassium deficiency in general, however, are attributable to external losses of potassium ion, as from starvation, dehydration, alkalosis, diarrhea, vomiting, suction drainage, fistulas, burns, radiation effects, deglycogenation, tissue anoxia, administration of adrenocortical steriods, cortical tumors (aldosteronism), et cetera.

The pathologic consequences of potassium loss are varied. The predominant effects are usually manifested in relation to muscle action, particularly in muscles of the intestinal, respiratory and cardiac systems. Thus such symptoms as weakness, lassitude and lethargy, intestinal distention, and respiratory difficulties may be conspicuous enough to demand immediate attention. Probably of more ultimate importance, however, is the loss of potassium from heart muscle. This may lead to cardiac dilatation, hypotension, ectopic rhythms, fibrillation, or tachycardia. Recently attention has been paid, also, to the effects of potassium loss from cardiac muscle in increasing the sensitivity of the heart to digitalis, thereby inducing or augmenting digitalis toxicity.[4] Dramatic therapeutic effects have been observed under such conditions from the use of potassium salts. These findings are merely a further demonstration of the biologic importance of potassium ion in myocardial functioning and a further indication of the need for more information about the mechanisms of action of potassium and other ions, particularly sodium, in the heart itself.

Experimental studies in animals deprived of potassium have repeatedly demonstrated the vital importance of potassium ion in relation to heart function. This has been shown in several species. In the rat, the production of potassium deficiency by the use of diets low in potassium, or by the injection of desoxycorticosterone acetate, leads to the development of focal necroses of the myocardium. We have produced such lesions by subjecting protein-depleted rats to protein repletion by the feeding of diets devoid of potassium.[5] Within two or three weeks many of the animals die, and at autopsy the conspicuous findings are massive cardiac necroses, extreme congestion and edema of the lungs, and signs of generalized passive hyperemia. One explanation of these pathologic changes is that in the course of nutritional repletion, as body mass and blood volume increase, with a concomitant increase in the cardiac work-load, the absence of dietary potassium leads to acute potassium deficiency in the heart itself, and areas of cardiac muscle undergo coagulation necrosis reminiscent of a myocardial infarct, although of course induced in a different way. Moreover, these necroses are related importantly to sodium ion, as evidenced by the fact that their development can be prevented if repletion is accomplished by feeding diets devoid of both potassium and sodium ions. The point to be emphasized here, however, is the importance of both ions in heart functioning and the need to recognize this in relation to potassium deficiency states, to post-surgical management, and particularly to congestive heart failure.

A second important metabolic aspect of potassium is its relationship to nitrogen. For example, since the early experiments of Benedict[6] it has been known that in a fasting human subject the ratio of urinary nitrogen to potassium is approximately ten to one. This is likewise the ratio of the two elements in normal muscle. It seems reasonable to suppose, therefore, that in severe catabolic processes there must be a steady loss from muscle of both nitrogen and potassium. It seems reasonable to assume, moreover, that in the processes of convalescence, these two elements must re-enter regenerating muscle in similar proportions; and since potassium is an indispensable ion for tissue reconstruction, it must be made nutritionally available. This presents a particularly interesting problem in parenteral feeding, especially in relation to the use of potassium-poor plasma, and it has become evident that potassium must be supplied in order for the metabolic utilization of plasma to be effective. This raises an additional question about the intracellular utilization of potassium in relation to catabolism in general. Currently there is a growing tendency to use potassium salts freely in therapy, regardless of the general metabolic state of the patient. What does this mean from the standpoint of the metabolic results to be achieved?

Metabolic experiments in man, by Howard and Bigham,[7] and by Albright and Reifenstein,[8] have indicated that nitrogen and potassium generally follow parallel courses of excretion, tending to move together in and out of cells in a fixed relationship to one another. In severe catabolism, therefore, if both nitrogen and potassium are leaving the body in considerable amounts in the urine, one may wonder whether potassium administered at such a time will be able to enter and remain in cells which are themselves steadily losing potassium. Is it possible that the administered potassium merely joins that being poured out into the urine? It is of course probable that extracellular potassium has important functions and that, even during severe catabolism, not every cell in the body is equally affected. Therefore, under unusually adverse catabolic conditions some cells presumably can utilize potassium ions to some degree.

In attempting to find answers to these questions we have studied the problem experimentally in normal and in protein-depleted rats subjected to varying periods of positive and negative nitrogen and potassium balances. Our general scheme was to examine quantitatively the relationships of anabolism and catabolism with respect to the tissue utilization of potassium. We wished to know (1) to what extent protein-depleted animals can undergo effective protein repletion and retain administered potassium while ingesting rations containing or lacking nitrogen, and (2) the interrelationships of nitrogen and potassium in normal animals similarly treated. Such studies can be made reasonably precise because the nitrogenous needs of the animals can be met by the feeding of appropriate mixtures of amino acids; and the animals can be thrown into acute catabolism merely by the omission from the diet of one essential amino acid, as, for example, tryptophan. Thus their ability to retain potassium can be determined in relation to their general metabolic states as evidenced by positive or negative nitrogen balances.

These experiments demonstrated that the parenteral administration of potassium salts while the animals were in negative nitrogen balance failed to establish positive potassium balances until the nitrogen balances had also become positive as a result of the feeding of adequate amino acid mixtures. Furthermore, the omission of one essential amino acid from the ration led to a negative nitrogen balance and a concomitant negative potassium balance despite the continued administration of potassium salts.

The results suggest the following conclusions: The problem of correction of a potassium balance is more complicated than simply that of the administration of potassium salt alone. On the contrary, the experiments indicate that the metabolic state of the tissues themselves largely determines their capacity to retain and to utilize potassium ion. For optimal nutritional replenishment of depleted tissues both nitrogen and potassium are essential, and probably in definite relationships to one another. In nutritional repletion, presumably, the tissue need is for both elements; and if losses of both are going on concurrently, the need for both would seem to be particularly critical. If this reasoning is correct, the basic nutritional problem would seem to be the re-establishment of the anabolic state. Once this has been accomplished, potassium utilization by cells should quickly follow.

Having said this, however, it is obvious that the solution of the problem is far from easy, and doubtless there are numerous metabolic situations as, for example, in post-surgical catabolic states, after severe burns, after radiation injury, et cetera, where the conversion from catabolism to anabolism appears to be well-nigh impossible. Nevertheless, rather than yielding to the point of view that catabolic processes are at times inevitable, it would seem all the more important to recognize the problem as clearly as possible because in many instances it may be possible at least to minimize the adverse effects of tissue losses of important constituents. It is possible, therefore, that despite the many years of study which have been devoted to it, the single most important metabolic problem may still be that of nitrogen balance. If and when that problem is solved, potassium utilization should automatically fit into its proper place in the reconstruction processes as well as in those of tissue maintenance.

The final phase of this presentation deals with the relationship of sodium to potassium. Here a reciprocal relationship has long been evident. It is now known, also, that although sodium ions function most prominently in the extracellular fluid, they may enter cells and at times exert a harmful effect.[9] For example, accumulating evidence indicates that whereas potassium ions activate certain important enzyme systems, sodium ions inhibit these same reactions. Under what conditions, therefore, may imbalances of these two cations have clinical significance?

It is generally assumed, mainly as a result of studies of electrolyte exchange in muscle, that as potassium ions diffuse from a cell, sodium ions tend to enter it and "replace" them. It is also assumed that normally there is an intracellular mechanism, termed the "sodium pump," which acts continuously to drive out the sodium ions which have entered the cell. When the homeostatic mechanisms governing the process fail, however, sodium ions may accumulate within the cell, thereby forcing out potassium ions; this process is referred to as "displacement." It is also possible that when sodium ions in the extracellular fluid considerably outnumber potassium ions, the sodium ions might competitively hinder the entrance of potassium ions into the cell. This possibility might be thought of as "ionic interference."

Although the evidence for replacement of potassium ions by sodium ions is better than is that for displacement or for ionic interference, the latter processes may conceivably operate, as, for example, in congestive heart failure, renal failure, toxemia of pregnancy, eclampsia, or because of excessive action of adrenal mineralocorticoids, such as in primary aldosteronism, all of which are associated with excessive bodily retentions of sodium. Under such conditions, displacements of potassium by sodium might lead to cellular damage, especially in respiratory or cardiac muscle.

In studying this problem we have fed growing rats diets low in potassium but excessively high in sodium over periods as long as fifty-three weeks. Under such conditions the animals grew reasonably well, during which time they gradually lost potassium; and, in those eating the higher amounts of sodium chloride, myocardial necroses characteristic of potassium deficiency developed. Balance studies and carcass analyses indicated a bodily loss of potassium and a gain of sodium. Does this mean that the high intake of sodium led to the cellular displacement of potassium?

No final answer can as yet be given because of the fact that the polydipsia and polyuria induced by the high-salt intake may have promoted a steady loss of potassium through the kidneys. Arguing against this, however, are the observations of Seldin and Tarail[10] that in human subjects in whom diuresis was produced by the ingestion of large amounts of water or by the administration of solutions of glucose or mannitol, there was no increased excretion of potassium in the urine during the period of diuresis. We have observed a similar effect in young rats fed basal diets containing identical amounts of potassium but with either high-sodium or low-sodium content. Concomitantly, the amino acid and fluid intakes were equalized by supplying the animals with a potassium-poor solution of fibrin-hydrolysate (aminosol), so diluted as to force the animals to drink considerable amounts daily. Potassium-balance studies demonstrated a markedly lower retention of potassium in the animals on the high-salt intake, suggesting that the potassium loss through the kidneys was not the result of high fluid intake alone.

In conclusion, this discussion may be summarized as follows: In the course of metabolism during which cellular activities are constantly being influenced by a variety of homeostatic mechanisms concerned with the control of the internal environment, the elements potassium, sodium and nitrogen are intimately interrelated in their passages into and out of cells. Under pathologic conditions, however, as, for example, in the presence of deficits or excesses of one or more of these elements in the tissue fluids or cells, imbalances may occur. The correction of these imbalances by homeostatic readjustments represents the essential problem of nutritional, fluid and electrolyte management. It is gratifying that, since the mechanisms controlling these interactions are becoming better understood, therapeutic management is becoming correspondingly effective.

References

1. Fenn, W. O.: Introduction to a symposium on the metabolism of potassium. Journal Lancet, 73:163 (May) 1953.
2. Ellison, E. H.; Boles, T.: and Zollinger, R. M.: Potassium deficits in surgical patients. Am. Surg., 18:449-457, 1952.
3. Danowski, T. S.: The problem of hypokalemia. Arch. Int. Med., 95:370-373, 1955.
4. Enselberg, C. D.; Simmons, H. G.; and Mintz, A. A.: The effects of potassium upon the heart, with special reference to the possibility of treatment of toxic arrhythmias due to digitalis. Am. Heart J., 39:713-728, 1950.
5. Cannon, P. R.; Frazier, L. E.; and Hughes, R. H.: The influence of potassium on tissue protein synthesis. Metabolism, 1:49, 1952.
6. Benedict, F. G.: A Study of Prolonged Fasting. Carnegie Inst. of Washington, Publication No. 203:215-286, 1915.
7. Howard, J. E., and Bigham, R. S., Jr.: Conference on metabolic aspects of convalescence. Tr., 11th meeting, Josiah Macy, Jr. Found., New York, New York, Oct. 15-16, 1945.
8. Albright, F., and Reifenstein, E. C., Jr.: Conference on metabolic aspects of convalescence. Tr. 11th meeting, Josiah Macy, Jr. Found., New York, New York, Oct. 15-16, 1945.
9. Cannon, P. R.; Frazier, L. E.; and Hughes, R. H.: Sodium as a toxic ion in potassium deficiency. Metabolism, 4:297-312, 1953.
10. Seldin, D. W., and Tarail, R.: Effect of hypertonic solutions on metabolism and excretion of electrolytes. Am. J. Physiol., 159:160-174, 1949.

The Present Status of the Serofloculation Reaction

HARRY S. PENN, M.D.,
Los Angeles, California

IN this presentation I shall take you on an adventure of an idea. I shall introduce a new approach (at least it was new some twenty-five years ago) to the cancer problem. I shall discuss the various means employed which tended to substantiate, at least in a measure, the validity of this concept. I shall also try to show that the serofloculation reaction may prove to be an object of research of interesting and important heuristic value, as well as an important laboratory aid in the serodiagnosis of cancer.

During the last twenty-five years, we have been witnessing a distinct change in the field of cancer research. Classic theories have somehow gradually disintegrated under the attack of critical inquiry. New ideas as to the causation of cancer, many of them quite contradictory, have entered the arena and are fighting for recognition. They range from ideas based on purely philosophical speculations to those based on highly complicated physicochemical processes.

The Cohnheim theory postulating the origin of cancer from embryonic rest cells has been finally refuted.[1] The virus parasitic theory is another approach to carcinogenesis. Thus far, however, attempts to link the tumor-causing virus to mammalian malignancies (leukemia in mice as a probable exception) lack confirmation.[2] Views of more recent origin are based on a firmer foundation.

Haddow[3] contends that "the mechanism which permits unlimited growth must clearly reside in the cell itself. That it may reside partly at least in the cytoplasm is obviously a possibility for future investigations, both by cytological methods and by experiments."

The discovery of the milk factor by Bittner[4,5] is unquestionably of momentous importance. It opens new vistas for cancer research, and offers a more intimate insight of carcinogenesis.

In this seemingly chaotic state, it is difficult as yet to discern which of these concepts will emerge as the one destined to gain an enduring place in our views of the cancer problem.

In a publication about twenty years ago, as the result of some years of clinical and experimental investigations, I advanced the hypothesis that many forms of cancer may be the result of an endogenous carcinogen which may originate from cholesterol or its decomposition products,[6] and that such products being foreign to the organism may possess or acquire antigenic properties.[7] Following the first publication, it was gratifying to note that similar views were later expressed by other investigators, such as Fieser,[8] Greenstein[9] and Boyland.[10]

To quote a more recent one, Willis[11] is of the opinion that "not only has experimental work disclosed a great variety of exogenous carcinogenesis, but it has shown also that endogenous carcinogens may be formed in the body itself as a result of disturbed hormonal states, or other pathological conditions."

But what about the actual existence of the predicted endogenous carcinogen?

The answer soon came from the classic work of Kleinenberg, Neufach and Shabad[12,13] showing that the unsaponifiable fraction obtained from human cancerous livers, and, to some extent, noncancerous livers, possesses carcinogenic properties. The confirmatory evidence subsequently presented by Menke,[14] Aptekman,[15] Des Ligneris,[16] and Hieger,[17] and the extensive investigations carried out by Steiner,[18] left little doubt that fatty components of cancer origin, when injected into animals, will produce malignant neoplasms.

A number of other investigations, some of them still unpublished, were carried out in our labora-

---

Dr. Penn is Associate Clinical Professor of Radiology (Oncology), Department of Radiology, University of California Medical Center, Los Angeles, California.

The C. M. Jackson Lecture given before the Phi Beta Pi fraternity at the University of Minnesota, February 16, 1956.

This work was supported in part by the Jewish Fund for Medical Research—Trattner Foundation, and by a grant-in-aid from the U. S. Public Health Service.

tory to test the validity of the endogenous carcinogen concept.

It was assumed that the presence of such a carcinogen in the circulation would necessarily be in very small quantities. If only means could be found to identify its presence! An interesting experiment by Hieger[19] furnished the necessary link. He has shown that the fluorescence of a solution of most of the polycylic carcinogenic hydrocarbons, such as 20-methylcholanthrene, 1-2-5-6-dibenzathracene, when subjected to the excitation by ultraviolet light, will produce on the spectrographic plate three characteristic bands in the region of 4000-4400 Å.

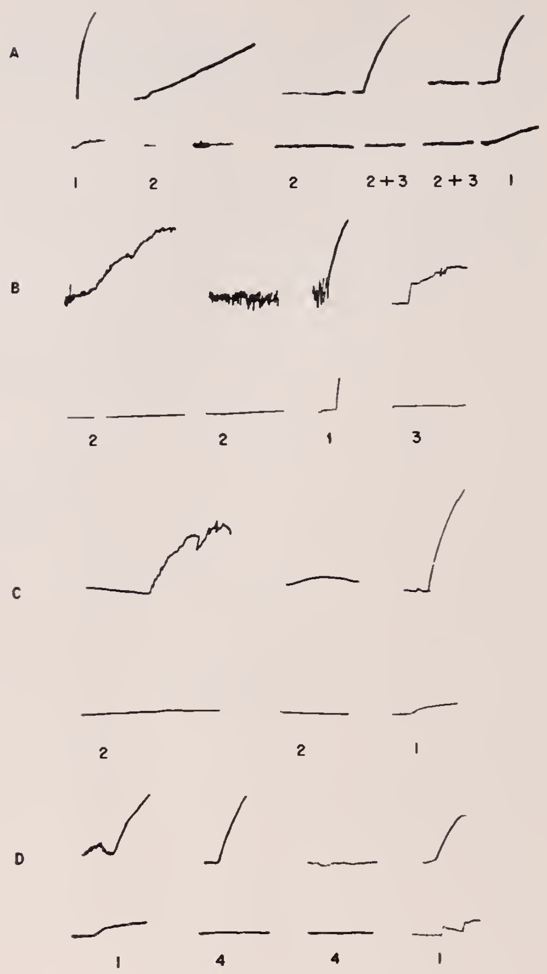


Fig. 1. *A* shows that independent reactions can be elicited when the sensitized gut is challenged by either the lipid alone or lipid and horse serum mixture.

B illustrates that the guinea pig can be passively sensitized with rabbit antiserum prepared against Ca.T.L. with horse serum. To determine whether or not horse serum was indispensable in the process of immunization, an antiserum against Ca.T.L. was produced under aseptic precautions without horse serum.

C This animal was sensitized to Ca.T.L. without Schlepper. The specific response obtained is evident that antibody against Ca.T.L. alone can be produced in the guinea pig.

D shows a guinea pig passively sensitized with a rabbit antiserum produced against the cancerous non-saponifiable fraction without horse serum. It demonstrates that the cancerous non-saponifiable component is likewise antigenic when tested under conditions described for *C*.

Key to figures in legends:

1=Histamine
2=Acetone soluble lipid obtained from human cancerous livers (Ca.T.L.)
3=Horse Serum (H.S.)
4=The non-saponifiable component (Ca.N.S.) obtained from Ca.T.L.

This technique offered an opportunity to examine some very small quantities of material. The liver being the principal organ of steroid metabolism, and since the nonsaponifiable fraction has been shown to possess carcinogenic properties, this organ was chosen for source material. Cancerous livers were hydrolyzed, the nonsaponifiable fraction isolated, dissolved in petroleum ether, and chromatographed on a silicic acid column. The ethanol extracted material of the lower zone on the column, when subjected to Hieger's technique, gave a three-banded structure almost identical with the one produced by methylcholanthrene. This formation was found to be absent in the similarly prepared nonsaponifiable fraction obtained from noncancerous livers. This investigation was carried out in collaboration with Dr. Joseph Kaplan, Professor of Physics, University of California, at Los Angeles, and Dr. Sidney Rubens.[20]

Concurrently, the possible antigenicity of the carcinogenic nonsaponifiable fraction was investigated. The experiments were confined primarily to the Schultz-Dale reactions on a series of guinea pigs sensitized with the acetone soluble fatty component as well as with the nonsaponifiable fraction, with and without a "Schlepper." The animals produced characteristic specific responses to the nonsaponifiable fraction as well as to the foreign proteins employed (Fig. 1). The introduction of lipoid material into the muscle-bath, however, produced an emulsion and slowed the contractable response. To secure additional evidence that these reactions were truly specific, guinea pigs were passively sensitized by injecting them with rabbit antiserum prepared against the cancerous and noncancerous acetone soluble lipid, and its nonsaponifiable components. It appears that guinea pigs can be rendered sensitive to the crude total lipoid component when this is injected with or without horse serum.

Reverse Passive Sensitization

In order to extend information concerning lipoid antigenicity and to facilitate the testing of materials of weak immunizing capacities, cross reactions of the several lipoid derivatives were studied by means of reverse passive anaphylaxis.

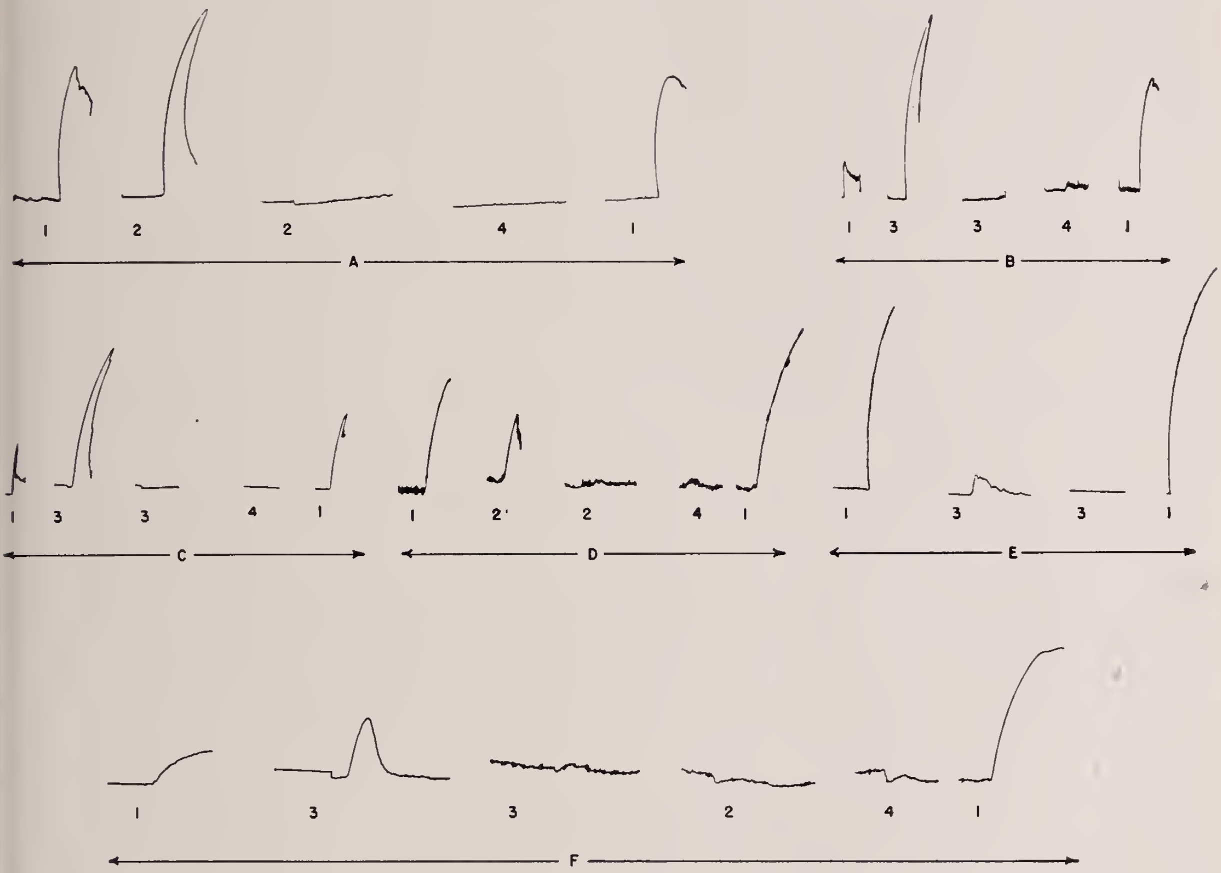


Fig. 2. *A* shows a specific sensitization of the animal to cancerous total lipid (Ca.T.L.) antiserum after three hours' incubation.

B shows a cross reaction with antiserum to non-cancerous total lipid (N.T.L.) after three-hours' incubation.

C. Same as *B*.

D shows that the animal reacted to rabbit antiserum against cancerous total lipid (Ca.T.L.) but not against normal rabbit serum. In this animal, incubation interval lasted only five minutes.

E, a different strip of the same gut as in *D*, shows cross reaction with non-cancerous total lipid (N.T.L.) antiserum. The reaction is somewhat weaker than the previous homologous response.

F, animal incubated for three hours, shows that a previous exposure to non-cancerous total lipid (N.T.L.) antiserum abolished the response to the homologous Ca.T.L. antiserum.

Key to figures in legend:
1=Histamine
2=Cancerous Total Lipid (Ca.T.L.) antiserum
3=Normal Total Lipid (N.T.L.) antiserum
4=Normal Rabbit Serum (N.R.S.)

Previous experience has shown that intravenous injection of the necessary volume of lipid would frequently result in fatalities because of pulmonary embolism. To avoid this complication, a different maneuver to insure proper distribution and dilution of the antigen had to be employed. First antisera were produced against all lipids employed. The lipids were emulsified with normal guinea pig serum and administered to the test animals via the carotid artery in the following manner:

The carotid artery was exposed under ether anesthesia, the test antigen instilled intra-arterially, the vessel ligated, and the wound closed. The animals were allowed to recover, permitted to survive for periods ranging from five to 180 minutes, and then sacrificed and prepared in the usual manner. The results of tests performed with the reverse passive technique will be fully reported in a subsequent publication. For the present purpose of establishing evidence of antigenicity, a few of the records are presented (Fig. 2).

According to evidence secured from the Schultz-Dale experiments, there can be little doubt regarding the fact that lipoid extractives can be antigenic. We have shown that the method used to prepare serologically active lipids[21] can also produce materials capable of sensitizing guinea pigs and immunizing rabbits and, further, that the antibody produced in rabbits can be passively transferred to guinea pigs.

Because of the difficulty of absorbing antisera with lipids, we have thus far been unable to eliminate cross reactions with lipids obtained from noncancerous livers. Hence, the question of the identity or difference among antigens found in cancerous and noncancerous livers is still moot. Recent developments, however, indicate that such differentiation may be possible. Results of this investigation will be published at a later date.

In addition, rabbits injected under aseptic conditions with an acetone soluble lipoid component without "Schlepper," obtained from either cancerous or noncancerous livers, produced antisera giving definite seroflocculation reactions consistent with a characteristic antibody complex. Sera of rabbits bearing the Brown-Pearce tumor were found to give positive seroflocculation reaction when mixed with the human nonsaponifiable liver antigen. Conversely, the nonsaponifiable component obtained from Brown-Pearce tumor gave a positive reaction when mixed with the serum of cancer-bearing patients.

The above reactions were found to be negative when the lipoid antigens were obtained from noncancerous source material. This may be strongly indicative of the presence of a common, but not necessarily identical, component present in the human cancerous tissue as well as in the Brown-Pearce tumor.

In the light of the above findings, one could hardly escape the logical conclusion that the existence of the hypothetical endogenous carcinogen may be further substantiated by demonstrating a corresponding antibody to the nonsaponifiable component obtained from cancerous livers in the serum of a cancer-bearing patient.

This approach presented a number of formidable difficulties. First, since the unsaponifiable fraction was never before employed as an "antigen," there was no previous literature to which to refer. Second, the number of variables, such as saline concentration, pH, amount of cholesterol, amount of serum, the dilution of the antigen, and a number of other factors, required almost endless determinations, the total of which reached astronomical figures.

The results of the original liver "antigen" obtained from cancer-bearing patients showed 80 to 81 per cent specificity when tested against the sera of patients with known histologically proven malignancy. Following a refinement of this material, the specificity increased to over 90 per cent.[7]

At present the "antigen" obtained from the livers of patients who died of cancer is under investigation by Dr. Richard F. Riley in our department. His efforts are directed toward the identification of the serologically active component or components.

Further study of the serofiocculation reaction brought to light the fact that while the "positive" reactions, percentagewise, were greatest in the sera of cancer-bearing individuals, it was also found "positive" in the sera of persons having other pathologic conditions. The phenomenon then posed a series of challenging problems.

It was very important, for instance, to determine whether the serofiocculation reaction is a true antigen-antibody complex. Should it prove to be so, what is its meaning? What is its role in the scheme of human metabolism? Are we generating antibodies to certain lipids in response to stress, such as trauma? Are some individuals under these conditions more responsive than others? And, most important, does the cancerous process evoke a specific antibody?

In order to gain further insight into the significance of this phenomenon, it was soon realized that because of the relative scarcity of cancerous livers, the limited quantity of the final fraction obtained was insufficient for our investigations. It was, therefore, pertinent to inquire whether other compounds more readily available would manifest similar serofiocculation attributes and lend themselves as satisfactory substitutes.

Following the original postulate that the hypothetical carcinogen may arise from normal steroids, and since the bile acids are normal steroid constituents, it was desirable to ascertain whether or not a dehydration product of desoxycholic acid would produce a serologically active compound if the conversion were carried out at body temperature. Subsequent experiences seemed to justify this expectation.

Details of the procedure were recently reported.[22] Briefly stated, desoxycholic acid was treated with refrigerated concentrated sulphuric acid under controlled conditions at a temperature range between 38 to 40°C. The serologically active material was obtained by chromatographic separation on activated alumina. This was later identified by Dr. Haagen-Smit, Professor of Organic Chemistry, California Institute of Technology, as chiefly, the ethyl ester of choladienic acid. Dr. Haagen-Smit subsequently produced this compound in crystalline form.

It should be evident from the preceding that the impelling force motivating these investigations was the desire to find supporting evidence for a given concept. At no time was I prompted to search for a "test" for cancer.

As it may be expected, the liver nonsaponifiable material as a derivative of tumor tissue or cancerous livers has given more accurate information than the ethyl ester of choladienic acid. For it is obvious that the metabolic processes of animals, including humans, are incapable of producing this compound similarly to the rigorous laboratory conditions. Even the very existence of this compound in the animal organism is questionable. The serofloculation phenomenon, therefore, in the case of the bile acid derivative, is at best a cross reaction and the results, naturally, must be interpreted with greater caution.

Now let us examine the serofloculation reaction as to the extent of its usefulness as a laboratory aid in cancer detection. During the years, a considerable number of cancer tests based on serologic abnormalities were reported. Since time and space would not permit enumeration of them all, we shall confine ourselves to the most promising few.

Winzler and Burk[23] found increased mucopolysaccharides in cancer sera. An increase was also noted in many other pathologic conditions. Black's[24,25] methylene blue test, consisting of boiling patient's serum with methylene blue, showed, it was claimed, a difference between cancer and normal sera. This manifestation is due to a decrease of reducing substances in the serum as well as a decreased thermal coagulation capacity. Huggins'[26] test is based on the findings that the serum from a cancer-bearing individual requires less iodoacetate to prevent coagulation when heated to 100°C. than serum from normal individuals.

The serofloculation reaction is carried out by mixing the serum of the cancer-bearing patient with "antigen" (either the cancerous liver nonsaponifiable fraction or the bile acid derivative) under controlled conditions. The suspension is agitated in a Kahn shaker for three minutes and centrifuged for ten minutes. The tubes are then "flipped" and examined. The finding of discrete particles floating in a clear medium is interpreted as a "positive" reaction. A turbid suspension, or particles floating in a turbid medium, is interpreted as a "negative" response. In the former we presume we are dealing with an antigen-antibody complex.

It is not the objective of this presentation to evaluate the comparative merits of the serofloculation reaction with the tests previously mentioned, but rather to emphasize the marked difference between this phenomenon and the changes manifested by the other tests. In those tests we are dealing with an increase or a decrease of normally occurring components. In the serofloculation reaction, on the other hand, we are dealing with what has thus far been indicated, although not conclusively proven, to be a new serum protein produced by invasive cancer and to some extent by other pathologic states.

Now we come to the problem of serodiagnosis of cancer, but before entering into this discussion it is important to clarify in our minds at what stage of development of this complex manifestation we term malignancy a serologic test should be "positive." A critical examination of the cancerous process both on the experimental and clinical level may shed some light on the question.

When a minimal dose of a potent carcinogen, such as methylcholanthrene, is applied to the skin of a mouse, nothing may happen until another application of an irritant, such as croton oil,[27] is made. Only then certain changes take place, such as thickening of the skin with subsequent formation of papillomata which eventually, in many cases, become malignant.

The second medication has been termed a co carcinogen. On the basis of this and many other analogous experiments, a theory of a two-stage mechanism of the causation of cancer has been advanced. First, where a strong carcinogen in minimal dosage or a weak carcinogen in a higher dosage acts upon a group of susceptible cells producing an irreversible damage, such groups of cells are called latent or dormant cancer cells. It is postulated that at some future date an irritant, or any other "trigger" mechanism, may act on this damaged area and by so doing eventually complete the cancerous process. A similar situation is frequently encountered clinically.

At what stage of tumor development is it desirable to have a "positive" test for malignancy? In the light of the experiments just mentioned, it is quite conceivable that many of us may be harboring throughout our body clumps of cells which from a histologic standpoint could be termed the dormant malignant cells. If a test so sensitive and refined would record such a condition, its impracticability is quite obvious.

When we speak of a mechanism to demonstrate the presence or absence of malignancy serologically, it stands to reason that before any such demonstrable factor can manifest itself, certain changes have to take place in the serum proper. It is conceivable that such changes in the serum can be produced by an endogenous carcinogen sufficiently potent either quantitatively or qualitatively to bring about an active invasive process, and that the corresponding changes must be specific for malignancy. Unfortunately, however, thus far no such specificity has been demonstrated conclusively in human sera. To what extent, then, can the utility of the seroflocculation reaction be employed to advantage as a laboratory aid in cancer diagnosis?

In our series of 763 cases, we found that it will give over 90 per cent correct diagnoses of histologically proven malignancies. The diagnostic value falls sharply in cases of non-invasive malignancies, such as tumors *in situ* or small (1 cm. or less) tumors of the skin and breast.[28] The reason for the difference is not clear. The seroflocculation reaction will be positive in cases of trauma, such as postoperative conditions, and in many other active pathologic conditions with a temperature of 101°F. or over.

As to these false positives, we have definite indications that most of them can be eliminated by a slight modification of the procedure. We hope to publish shortly details of the modified technique. In any case, a thorough physical examination will usually disclose the probable cause of the positive reaction.

The seroflocculation reaction may also serve as an indicator in postoperative and postradiologic treatment. In a number of instances when the patients could be followed, it was found that a "positive" serum preoperatively changed to a "negative" following complete extirpation of the malignancy.

In conclusion, I should like to state most emphatically that the seroflocculation reaction *in its present stage of development* is not a specific test for cancer. The test, if you care to call it so, may serve as an important laboratory aid to diagnosis within the framework of its limitations. The mechanism of this particular seroflocculation reaction is yet to be determined.

It is my sincere hope to stimulate a greater interest by those in their respective fields of steroid chemistry, immunochemistry, intermediary metabolism, et cetera, so that they will devote some of their time and efforts to investigate and evaluate the significance of this interesting phenomenon.

Acknowledgment

I wish to take this opportunity to express my sincere thanks to Dr. George Feigen, Assistant Professor of Physiology, Stanford University, for his guidance and co-operation in carrying out the Schultz-Dale reactions.

References

1. Nicholson, G. W.: Quoted by Willis, R. A. in Pathology of Tumours, 1st ed. p. 193. St. Louis: C. V. Mosby Co., 1948.
2. Kidd, John G.: Viruses and virus-like agents as causes of cancer. Bull. Johns Hopkins Hosp., 82: 583-600, 1948.
3. Haddow, A.: Transformation of cells and viruses. Nature, 3902:194, 1944.
4. Bittner, J. J.: Breast cancer in mice as influenced by nursing. J. Nat. Cancer Inst., 1:155, 1940.
5. Bittner, J. J.: Possible relationship of the estrogenic hormones, genetic susceptibility, and milk influence in the production of mammary cancer in mice. Cancer Research, 2:710, 1942.
6. Penn, H. S.: Inoperable malignancy. M. Rec., 142:213-217, 1935.
7. Penn, H. S.: Tumor lipoids. Preparation of a serologically active nonsaponifiable fraction of liver of cancer-bearing patients. J. Nat. Cancer Inst., 12:1389-1416. 1952.
8. Fieser, L. F.: The Chemistry of Natural Products related to Phenanthrene, 2nd ed. New York: Reinhold Pub. Corp., 1936, p. vii.
9. Greenstein, J. P.: Biochemistry of Cancer. 1st ed. New York: Academic Press, Inc., 1947, p. 103.
10. Boyland. E.: Chemistry of neoplastic tissue. Ann. Rev. Biochem., 18:217-242, 1949.
11. Willis, R. A.: Pathology of tumors. 1st ed. p. 203. St. Louis: C. V. Mosby Company, 1948.
12. Kleinenberg, H. E., Neufach, S. A., and Schabad, L. M.: Endogenic blastogenic substances. Am. J. Cancer, 39:463-488, 1940.
13. Kleinenberg, H. E., Neufach, S. A., and Schabad, L. M.: Further study of blastomogenic substances in the human body. Cancer Research, 1:853-859, 1941.
14. Menke, J. F.: A preliminary note on the extraction of a carcinogenic factor from primary human mammary cancer. Science, 92:290-291, 1940.
15. Aptekman, P. M., King, H. D., and Lewis, M. R.: A sarcoma-producing factor extractable from transplanted rat fibrosarcomas. Cancer Research, 3:856-857, 1943.
16. Des Ligneris, M. J. A.: The production of benign and malignant skin tumours in mice painted with Bantu liver extracts. Am. J. Cancer, 39:489-495, 1940.
17. Hieger, I.: The examination of human tissue for carcinogenic factors. Am. J. Cancer, 39:496-503, 1940.

(Continued on Page 582)

Resectional Surgery for Pulmonary Tuberculosis

MELVIN M. REEVES, M.D., IVAN D. BARONOFSKY, M.D.,
LYLE TONGEN, M.D., COLEMAN CONNOLLY, M.D.,
F. JOHN LEWIS, M.D.

Minneapolis and Saint Paul, Minnesota

RESECTIONAL surgery for pulmonary tuberculosis is an established and accepted therapeutic procedure. It is the purpose of this paper to summarize the experiences and results of such therapy in a general hospital with a special tuberculosis division (Ancker Hospital, St. Paul).

The indications for resectional pulmonary surgery used at Ancker Hospital are much the same as the indications used at other institutions.[1,2] Thoracoplasty failure, lower lobe disease, bronchostenosis, and associated bronchiectasis are all indications for resection. Furthermore, all cavitary lesions and all nodules larger than one centimeter are resected. In general, any extensive process that appears resectable in a fair to good risk patient is considered to be an indication for resection. Inadequate cardiorespiratory reserve has been the main contraindication to pulmonary resection. Age alone has not limited the use of surgery. Before resectional surgery is performed, a plateau of benefit from bed rest and chemotherapy is obtained. This usually takes from five to nine months.

Clinical Material

Between January of 1948 and July of 1955, 238 consecutive patients with pulmonary tuberculosis have undergone 269 pulmonary resections. These cases form the basis of this report.

Age, Race, and Sex.—A total of 129 women and 109 men comprise the series. This ratio of women to men of 1.18 to 1.0, is in accord with other reported series[3,4].

The age range of the patients is four to sixty-eight years. As illustrated in Table I, forty-four patients were under twenty years of age and forty-six patients were over fifty years of age. The average age was 36.8 years and the median age was 36.0 years. The average age of the men was eight years greater than that of the women, pointing out again that tuberculosis is becoming a disease of older men. All but twenty-three patients were of the Caucasian race.

Stage and Extent of Disease.—Far advanced tuberculosis was present in 48.8 per cent of the patients, moderately advanced disease in 39.9 per cent and minimal disease was present in only 11.3 per cent of the patients, using the standards of the National Tuberculosis Association (1950).

Nearly one-half (48.8 per cent) of the patients had bilateral disease. Unilateral disease was equally divided between the right and left sides.

Surgical Procedures.—We agree with Schlosser[8] that any residual caseous disease is a definite threat to the patient's future health, hence, the aim of resectional surgery at Ancker Hospital has been to remove as much of the disease process as possible and yet not leave the patient a respiratory cripple. In order to accomplish this end, pneumonectomy has been performed in thirteen patients, an incidence of 4.8 per cent of all the resections; lobectomy has been used eighty-two times for an incidence of 30.5 per cent, and segmental resection has been used 137 times for an incidence of 50.9 per cent. Minor resections such as subsegmental resections, open and closed wedge resections, and nodulectomies were performed in thirty-seven cases, 13.8 per cent of all resections.

Thoracoplasty has been used only as an adjunct to resection and it is considered a safe procedure to perform the thoracoplasty and the resection at the same time in selected patients[6]. Thoracoplasty was necessary in seven of the thirteen cases of pneumonectomy (54 per cent). Only thirty-six (30.5 per cent) of the patients undergoing lobectomy required a thoracoplasty, whereas nine (6.5 per cent) of segmental resections required a thoracoplasty.

From Ancker Hospital, Saint Paul, and the Department of Surgery, University of Minnesota Medical School.

The frequency of the various resections is illustrated in Table II.

Deaths

During the first postoperative month seventeen deaths occurred. an operative mortality of 6.3 per cent. Two additional deaths are recorded during the later period of postoperative hospitalization, for an total over-all operative mortality of 7.1 per cent. This is equivalent of 7.9 per cent over-all patient mortality. The average age of the patient that expired was 45.8 years compared with 36.8 years for the entire series. Nearly two-thirds (63.2 per cent) of the deaths were among men, whereas the men comprised only 45.8 per cent of the entire series. We have found as have others[5] that the death rate varies nearly directly with the stage of the disease, the extent of the disease process, and the extent of the resection. These facts are illustrated in Tables II, III. and IV. The age of the patient had little significance upon the mortality in patients over the age of thirty as shown in Table V.

TABLE I. AGE AND SEX DISTRIBUTION OF PATIENTS UNDERGOING RESECTIONAL SURGERY FOR PULMONARY TUBERCULOSIS AT ANCKER HOSPITAL

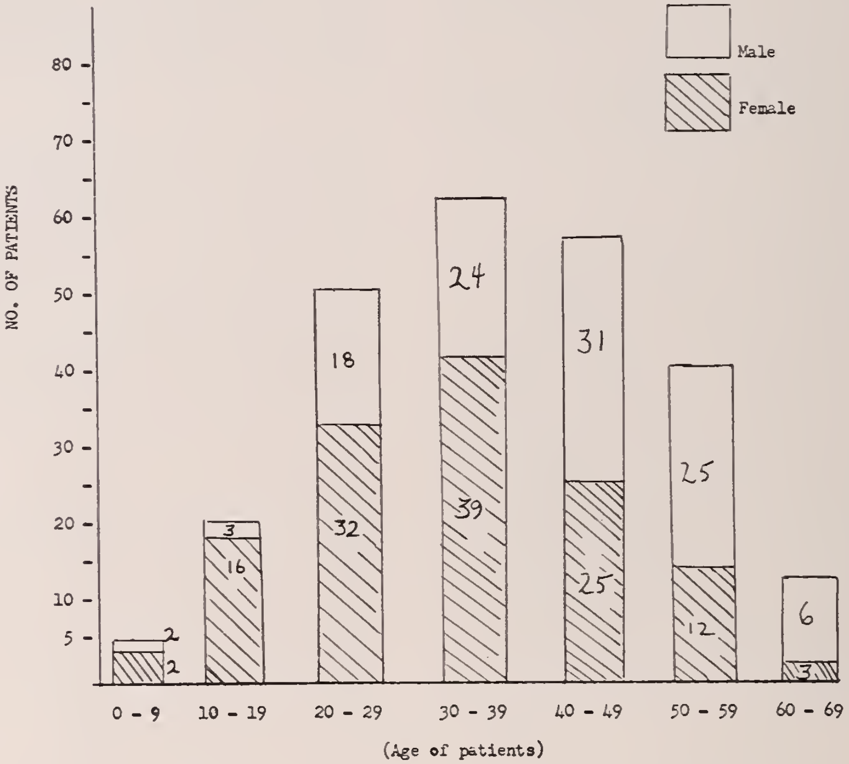


TABLE II. RELATION OF EXTENT OF THE PULMONARY RESECTION TO THE MORTALITY RATE

Extent of Resection	Number of Resections	Per Cent Total Resections	Deaths	Mortality of the Operative Procedure	Per Cent of Entire Operative Mortality
Pneumonectomy	13	4.8%	3	23.0%	1.1%
Lobectomy	82	30.5%	11	13.4%	4.1%
Segmental Resection	137	50.9%	4	2.9%	1.5%
Minor Resections	37	13.8%	1	2.7%	0.4%
Totals	269	100.0%	19		7.1%

Respiratory complications have been the leading immediate cause of death at Ancker Hospital as noted in Table VI. Bronchopneumonia was the cause of death in three patients, massive atelectasis in two patients, and unlisted respiratory

TABLE III. RELATION OF STAGE OF DISEASE TO MORTALITY RATE

	No. Patients	No. of Deaths	Mortality
Far advanced disease	116	17	14.6%
Mod. advanced disease	95	2	2.1%
Minimal disease	27	0	0.0%
Total	238	19	7.9%

TABLE IV. RELATION OF EXTENT OF THE TUBERCULOSIS TO THE MORTALITY RATE

	No. Patients	No. Deaths	Patients Mortality
Bilateral disease	116	15	12.9%
Unilateral disease	122	4	3.2%
Totals	238	19	7.9%

TABLE V.

Age of Patients	No. Patients	No. Deaths	Mortality Rate
0-19 yrs.	23	0	0.0%
20-29 yrs.	50	1	2.0%
30-39 yrs.	63	6	9.5%
40-49 yrs.	56	6	10.7%
50-59 yrs.	37	5	13.5%
60-69 yrs.	9	1	11.1%

TABLE VI. CAUSES OF DEATH IN PATIENTS WHO HAD RESECTIONAL PULMONARY SURGERY FOR TUBERCULOSIS AT ANCKER HOSPITAL

Respiratory deaths		11
Bronchopneumonia	3	
Atelectasis	2	
Unlisted (no autopsy)	6	
Congestive heart failure		2
Pulmonary embolism		2
Coronary occlusion		2
Cardiac arrest		1
Glomerulonephritis and diabetes		1
Total		19

disease in six cases. These later patients did not have postmortem examinations.

Pulmonary embolism, congestive heart failure, and acute coronary occlusion each caused two deaths. One patient died of cardiac arrest in the operating room and one patient died of acute glomerulonephritis complicated by severe diabetes.

Aggravating causes of death include diabetes mellitus in three patients, central nervous system syphilis and acute pancreatitis in one patient each. A bronchopleural fistula was present in one patient who died with respiratory complications.

Complications

Bronchopleural Fistula.—All persistent air leaks with or without fluid that were present for more than two weeks in the immediate postoperative period (in spite of repeated tappings or tube drainage) have been considered as bronchopleural fistulas.

A total of twelve patients developed a bronchopleural fistula. This is a patient incidence of 5.0 per cent or an operative incidence of 4.5 per cent. It was noted at Ancker Hospital as elsewhere[4] that a bronchopleural fistula is more apt to develop in patients who are slightly older than the average age and have bilateral or far advanced disease. The average age of the patients who developed bronchopleural fistula was 45.7 years compared with 36.8 years for the entire series. Bilateral disease was present in 83 per cent of patients with a bronchopleural fistula whereas only 48.8 per cent of the entire series had as widespread involvement. Likewise a large portion (75 per cent) of the patients developing a bronchopleural fistula had far advanced disease in contrast to the 48.8 per cent of the entire group.

All of the twelve patients who developed a bronchopleural fistula had been bacteriologically negative for at least three months before surgery and had received an average of 11.7 months of preoperative chemotherapy. It is interesting that 66 per cent of these patients had palpable disease left behind at the time of surgery. No correlation was noted in comparing the incidence of bronchopleural fistula with positive smears or cultures of the surgical specimen. It would appear from our findings that the incidence of bronchopleural fistula is not related to the presence or absence of demonstrable tubercle bacilli in the preoperative sputum or the surgical specimen. The problem does not appear to be a matter of type of closure of the bronchial stump as the incidence has been nearly the same for a variety of surgeons employing somewhat different techniques. Insasmuch as bronchopleural fistulas more commonly followed segmental resections (8.5 per cent) than lobectomies (3.6 per cent, it would appear that the severance of intersegmental and interlobar bronchi may be of importance.

The ultimate fate of our patients with a postoperative bronchopleural fistula has not been as discouraging as in other series.[4,7] A survey of the twelve patients with bronchopleural fistula reveals that one bronchopleural fistula closed spontaneously after twelve months of bed rest and chemotherapy. Surgical closure of the fistula was performed in four patients. The surgery consisted of further resections in three patients and simple primary closure of the defect in one case. The remaining cases had closed thoracotomy tube drainage with or without thoracoplasty. Only one death occurred among patients with bronchopleural fistula, and that occurred in a patient with severe congestive heart failure.

Spread of Pulmonary Tuberculosis During the Immediate Postoperative Period.—Any x-ray evidence of an infiltrative process during the postoperative period is considered a spread of the disease. Likewise the finding of a positive sputum or gastric washing is considered a spread of the tuberculosis. A total of thirty-five patients (13.0 per cent) fell into these catagories.

Three cases had only x-ray evidence of spread. These three patients had undergone segmental resection for unilateral disease and had received an average of seventeen months of preoperative bed rest and chemotherapy, and had had negative bacteriological studies for at least four months before surgery. Two were treated by further resection and one by bed rest and chemotherapy only. The spread was confined to the operated side in all three cases. This type of spread was limited to women of an average age of nineteen years.

A total of thirty-two patients had positive gastric or sputum bacteriological studies for the tubercle bacillus during the postoperative period. None of these had x-ray evidence of spread. The tuberculosis was considered far advanced in 69 per cent of these patients compared with 48.8 per cent of the entire series. Likewise 59 per cent had bilateral disease compared with 48.8 per cent for the entire series. Of these thirty-two patients eight had positive bacteriological examinations at the time of surgery. The remaining twenty-four patients had had negative bacteriological findings for an average of 5.6 months preoperative and received an average of seventeen months of chemotherapy.

Among the thirty-two patients who had positive bacteriological studies during the postoperative period, six developed bronchopleural fistula and have been included in the paragraph of discussion on bronchopleural fistula. One of these patients was treated by primary closure of the bronchopleural fistula, three by further resections, one patient by open drainage. One patient's fistula closed spontaneously while the patient was receiving chemotherapy and being kept at bed rest.

One of the patients with postoperative positive bacteriological examinations developed an empyema following a lobectomy. The empyema was treated by close drainage, and at a later date the patient underwent a further resection for removal of disease left behind at the original surgery. She died of respiratory failure following this second surgery.

One patient who had postoperative positive bacteriological studies received multiple aspirations of serous fluid from the thoracic cavity.

The twenty-four remaining patients all were treated with bed rest and chemotherapy. Of these twenty-four all but two had only one positive gastric or sputum examination. All patients who had evidence of spread have been able to be discharged with their disease in an arrested state.

Empyema without Evidence of Bronchopleural Fistula.—Four patients developed postoperative empyema without evidence of a bronchopleural fistula, an operative incidence of 1.4 per cent. Three had undergone segmental resection and one a lobectomy. Two of these cases were treated by repeated aspirations and two were treated by closed tube drainage.

Miscellaneous Complications. — Miscellaneous complications are recorded on fifty-one patients' medical records, (18.4 per cent incidence). These include cardiac arrest occurring twice in one patient who survived, four major wound infections, and three subscapular infections following "tailoring" thoracoplasties. In one patient the tip of a rubber catheter drainage tube broke off in the intrapleural space while the tube was being removed. Postoperative atelectasis was diagnosed in thirty-two cases. In two cases the atelectasis was massive and was considered to be the primary cause of the patient's death. The rest were treated by bronchoscopic aspiration under direct vision. Minor air leaks requiring only needle aspiration were found in fourteen patients. Eleven patients had intrapleural fluid that required aspiration. One patient survived a postoperative pulmonary embolism.

TABLE VII. FOLLOW-UP STUDIES

Surgery too recent for evaluation	27
Died at home of diabetes	1
Lost to follow-up	38
Followed 6 months to 5 years since discharge	172
Total	238
Bacteriological follow-up after discharge	
No spread or no positive bacteriologic finding	168
Single positive gastric	3
Spread	1
Total	172
Activity follow-up following discharge	
Full-time work	98
Part-time work	28
Ambulatory only	12
Hospitalized tbc	1
Hospitalized non-tbc	1
Not known	32
Total	172

Follow-up Studies

Physical examinations and bacteriological follow-up studies after the patient's discharge have varied some, due to the fact that several different physicians in private practice as well as the Ancker Hospital Out-Patient Department have been responsible for the patients' care since their discharge. In general, examinations are conducted at two-month to six-month intervals for two to three years and then at yearly intervals.

Of the 238 patients in the entire series, twenty seven have had operation too recently to be included in this follow-up series, one patient died at home from complications of diabetes and thirty-eight have been lost to the follow-up. A total of 172 patients have been followed between six months and five years since their discharge from the hospital, and form the basis of the following study as illustrated in Table VII.

Among the 172 followed, there has been only one case of proven active tuberculosis in the entire follow-up series. This occurred in a man subjected to a pneumonectomy. He left the hospital ten times against medical advice during his postoperative course and at the present time is hospitalized with cavitary lesions in his remaining lung.

Three patients had a single gastric aspiration that was found to be positive for acid fast bacilli. These were verified by guinea pig innoculations; however, no further positive bacteriological studies have been found over a period of two years, and the patient's disease is considered arrested.

The remaining 168 cases or 98.8 per cent of those followed have had no evidence of tubercle bacilli in studies of the sputum or gastric aspirations. There is likewise no roentgenographic evidence of spread in the same number of cases.

The ability of a patient to resume physical activity or employment is an excellent gauge of the results of any form of therapy. In this series ninety-eight (56.4 per cent) of the 172 patients followed have been able to resume full-time employment or engage in activities equal to their activities prior to their illness. Part-time employment or activities less than those before surgery are carried out by twenty-eight (16.5 per cent) patients. Only twelve patients are reported ambulatory but not employable. Two patients have been hospitalized, one for spread of tuberculosis as described above and one for other pulmonary difficulties. A total of thirty-two reports did not indicate the patient's activity.

Discussion

At Ancker Hospital considerable interest has been directed to the fate of the the patient with bilateral disease. Of the 238 patients in the series, 116 had bilateral disease, however, only twenty-six patients have undergone bilateral resections, three patients had multiple resections on the same side in order to close bronchopleural fistulas, and ninety had unilateral surgery.

Of the ninety patients with bilateral disease that had resectional surgery on only one side, fifteen died following their first surgery. Twelve refused a second operation, and twelve left the hospital against medical advice before the second operation could be performed. Nine patients had such poor physical condition and pulmonary reserve that a second operation was deemed contraindicated. One patient had the second operation at another hospital. There were eight patients with bilateral disease lost in the follow-up studies. The remaining thirty-three were treated successfully with continued bed rest and chemotherapy. At the present writing all of the patients with bilateral disease are considered to be arrested cases except those lost to follow-up and the one patient who is still hospitalized and whose case was discussed in the paragraph on postoperative spread.

Interest has also been directed to the use of chemotherapy for only short periods of time before resectional surgery is performed. In thirty-eight patients preoperative chemotherapy and bed rest was used for less than three months for various reasons. These reasons included the possibility of the presence of a pulmonary malignancy, only minimal disease and the lack of preoperative positive bacteriology. The follow-up results in this select group of patients is comparable to the entire series, and furthermore there were fewer complications. Only one death is reported among this group. The total complication rate is 10.6 per cent for patients receiving less than three months preoperative chemotherapy compared with 21.4 per cent for similar complications in the entire series. It is admitted that short-term chemotherapy has been used only in select patients but the fact is emphasized that it is a successful procedure in cases where surgery performed early is indicated.

Summary

1. A total of 269 pulmonary resections have been performed upon 238 patients at Ancker Hospital between January of 1948 and July of 1955.

2. An immediate postoperative mortality of 7.14 per cent and a total over-all hospital mortality of 7.98 per cent was found.

3. Bronchopleural fistulas occurred in twelve patients, an operative incidence of 4.46 per cent. Bronchopleural fistulas were found to occur more often in patients with bilateral disease and far advanced disease. There was no correlation between the occurrence of the bronchopleural fistulas and the preoperative bacteriological studies, bacteriological examinations of the surgical specimen or the type of bronchial closures.

4. Postoperative spread of tuberculosis was found in thirty-five patients, an operative incidence of 13 per cent. Three cases had roentgenographic evidence only of spread, whereas thirty-two patients were found to have positive bacteriology without x-ray evidence of spread.

6. Miscellaneous complications were found in fifty-one patients (18.4 per cent incidence) in the hospital.

6. Follow-up studies reveal that only three patients have had positive bacteriologic findings since discharge. Full-time employment is engaged in 56.3 per cent of the patients.

7. The use of short term medical treatment preoperatively in select patients gives as good results as long-term therapy in the average patient.

References

1. Gale, J. W.; Dickie, R. A., and Curreri, A. R.: Pulmonary resection in tuberculosis. Ann. Surg., 136:132-144 (July) 1952.
2. Day, J. C.; Tuttle, W. H.; O'Brien, E. J.; Hampton, F. Jr., and Mackson, T. L.: Resection in the treatment of pulmonary tuberculosis J. Thoracic Surg., 20:854-865 (Dec.) 1950.
3. Hughes, F. A.; Lowry, C. C., and Polk, J. W.: Thoracoplasty and resection for pulmonary tuberculosis. J. Thoracic Surg., 25:454-467 (May) 1953.
4. Davidson, L .R.; Alexander, H.; Lustig, G. J.; Kesner, B. J.; Stern, S., and Bloomberg, A. E.: An analytical review of excisional surgery for pulmonary tuberculosis. Dis. Chest, 25:1 (March) 1954.
5. Adams, W. E.: The surgical treatment of pulmonary tuberculosis. Surg., 36:1027-1041 (Nov.) 1954.
6. Ellis, F. H., Jr.; Clagett, O. T., and Carr, D. T.: Simultaneous pulmonary resection and thoracoplasty in the treatment of pulmonary tuberculosis. Am. Rev. Tuberc., 65:159-167 (Feb.) 1952.
7. Murphy, J. D.; Becker, B. B., and Swindell, H. V.: The complications and the results of treatment of bronchopleural fistula following resection for tuberculosis. J. Thoracic Surg., 24:578-586 (Dec.) 1952.
8. Schlosser, R. J., and Jarvis, F. J.: Resection failures in pulmonary tuberculosis. J. Thoracic Surg., 29:335-343, 1955.

SEROFLOCCULATION REACTION

(Continued from Page 576)

18. Steiner, P. E.: A cancerogenic tissue extract from human sources. Science, 92:431-432, 1940.
19. Hieger, I.: The spectra of cancer-producing tars and oils of related substances. Biochem. J., 24:505. 1930.
20. Penn, H. S., and Kaplan, J.: Fluorescence of cancerous and noncancerous lipoids. Nature, 160:18-19, 1947.
21. Penn, H. S., and Jacobsen, E. M.: A heterologous principle in human cancerous liver: its effect upon the Brown-Pearce tumor. J. Immunol., 54:17-33, 1946.
22. Penn, H. S., and Hokama, Y.: The role of bile-acid derivatives in the sero-flocculation reaction. J. Nat. Cancer Inst., 16:225-235, 1955.
23. Winzler, Richard J., and Burk, Dean: Blood proteose and cancer. J. Nat. Cancer Inst., 4:417-28, 1944.
24. Black, Maurice M.: Changes in the reducing power of serum or plasma of patients with malignant neoplastic disease. Cancer Research, 7:321-325, 1947.
25. Black, Maurice M.: Sulfhydryl reduction of methylene blue. Cancer Research, 7:592-594, 1947.
26. Huggins, Charles: Serum proteins in cancer. Cancer Research, 9:321-327, 1949.
27. Berenblum, I.: The mechanism of carcinogenesis. Cancer Research, 1:807-814, 1941.
28. Hall, C. H., et. al.: The role of bile-acid derivatives in the sero-flocculation reaction. Part II. J. Nat. Cancer Inst., 16:237-253, 1955.

X-Ray Pelvimetry by the Colcher-Sussman Method

A Study Comparing It with Stereoscopic Parallax Pelvimetry

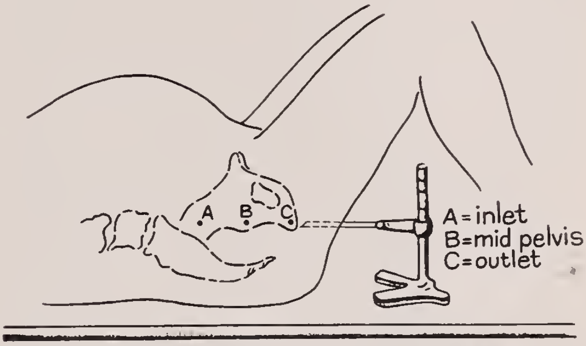
D. W. FREEMAN, M.D.
Minneapolis, Minnesota

THERE is reason to believe that x-ray measurements of the pelvis are not being as widely applied in obstetric problems as they should be. One of the reasons for this may relate to confusion created by the bewildering array of methods available. Most of them involve the use of special equipment and complicated calculations and techniques which tend to discourage widespread usage. The purpose of this report is to encourage the use of a simple technique described by Colcher and Sussman[1] and to report the results of a study comparing this technique with another, the stereoscopic parallax method of Hodges.

The basic problem to be solved in x-ray pelvimetry is one of correcting for the divergent distortion produced when objects are x-rayed. The image produced is invariably larger than the object x-rayed. The distortion increases with increasing object-film distance, and is reduced by increasing tube-film distance. It is clear that objects in the same plane, equidistant from the film will show equivalent distortion when x-rayed. The x-ray pelvimetry techniques which are most readily understood and simplest to apply are the so-called "position" methods which utilize this principle.

To correct for distortion in the AP pelvic diameters of obstetric interest, all of which are in the mid-saggital plane, it is only necessary to insert a radio-opaque marker or ruler with markings of known length between the patient's buttocks. If a true, or nearly true lateral view is obtained, it follows that the diameters in which we are interested and the marker are similarly distorted and that corrected measurements can be obtained simply by using the image of the marker for their measurement on the film.

The problem involved in applying the position principle to the transverse diameters of the pelvis is greater, however, since these diameters are ordinarily not in the same plane and their position relative to the film is difficult to determine. The method of Colcher and Sussman is one of appealing simplicity designed to obviate the difficulties here. This method is based upon the thesis that if the patient is positioned completely flat on her back on the x-ray table with thighs and knees flexed, the position of the pelvis is such that the greatest transverse diameter of the inlet, the interspinous diameter and the intertuberous diameter are all in the same plane and parallel to the film (Fig. 1). Since the level of the intertuberous diameter can be readily determined by external palpation, this means, if the thesis be true, that a marker can be placed at the same level as the diameters in which we are interested and again the corrected measurements can be obtained simply by measuring with the marker image.



COLCHER-SUSSMAN A-P POSITIONING

Fig. 1.

Colcher and Sussman did not report any check on the accuracy of their method beyond stating that no fetal death resulting from disproportion occurred in a series of 450 cases in which it was used. The technique does not lend itself to checking with a dried pelvis, since the whole prin-

---

From the Department of Obstetrics and Gynecology of the St. Louis Park Medical Center, Minneapolis, Minnesota.

ciple involves proper positioning of the patient. It was, therefore, thought worthwhile to check the method by comparing it with one of recognized accuracy.

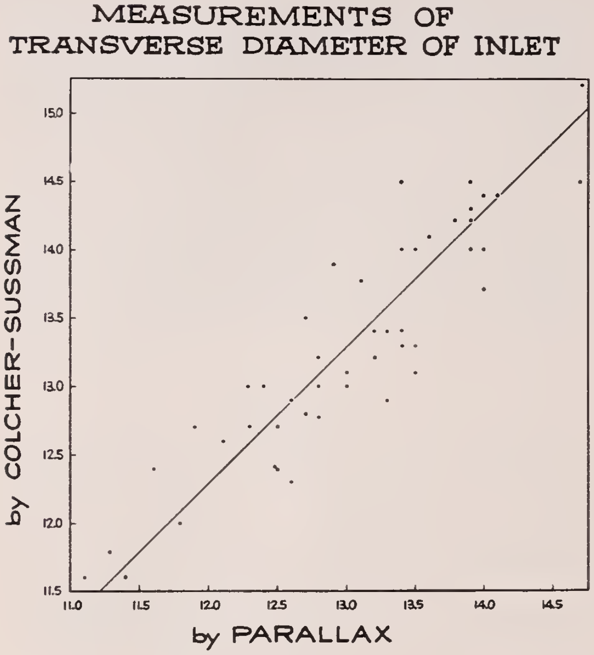


Fig. 2.

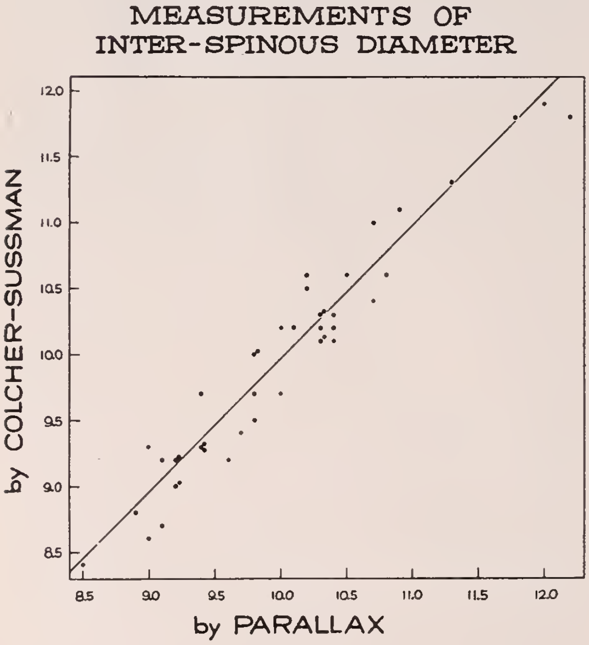


Fig. 4.

Method and Results

A check on the transverse diameters in a series of forty-nine pelvimetries was done by using simultaneously the Colcher-Sussman technique and the stereoscopic parallax method of Hodges. Patients were positioned as for the Colcher-Sussman method with the marker properly placed and two exposures were then made, the second after shifting the x-ray tube in accordance with the Hodges method.

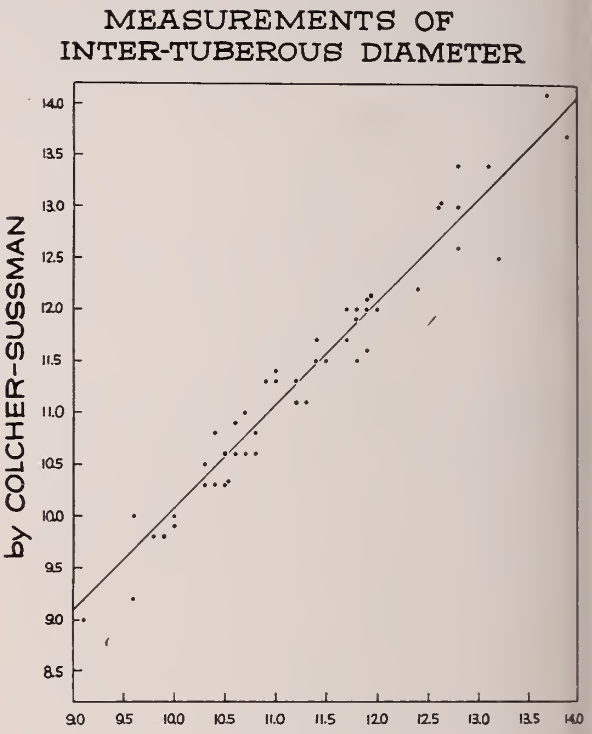


Fig. 3.

The amount of variation in results obtained by the two methods is shown in Table I and the scattergraphs (Figs. 2, 3, 4). The interspinous diameter could be determined by both methods in only forty-two cases because satisfactorily sharp end points could not be recognized in the remainder.

To clarify Table I somewhat by example, if one were to obtain an interspinous measurement by the Colcher-Sussman method of 10.0 cm., it could be said that the "best guess" as to what the corresponding measurement by parallax would be is 10.0 + 0.06 or 10.06, and one could be "95 per cent" confident that the parallax measurement would fall between 9.61 and 10.51 cm.

The data with respect to the transverse diameter of the inlet show that the measurement obtained by the Colcher-Sussman method is quite consistently larger than that obtained by paral-

TABLE I. ANALYSIS OF RESULTS OBTAINED BY COLCHER-SUSSMAN (C. S.) AND PARALLAX (PAR.) PELVIMETRY

Diameter	Transverse of Inlet	Inter-Spinous	Inter-Tuberous
Number of measurements	49	42	49
Mean difference C.S.—Par (Cm.)	+0.28	−0.06	+0.06
Standard deviation of differences	0.35	0.22	0.26
95% confidence interval	Par = C.S. −0.28 ± 0.71	Par = C.S. +0.06 ± 0.45	Par = C.S. −0.06 ± 0.53

lax. Thirty-four were larger, nine smaller, and in six the results by the two methods were identical. With respect to the interspinous measurement, however, twenty-four readings by the Colcher-Sussman method were smaller than those obtained by parallax, twelve were larger, and again in six there was no difference. In the case of the intertuberous diameter, twenty-four measurements by the Colcher-Sussman method were larger, seventeen smaller, and eight no different than those obtained by parallax. This indicates that in this series, the bony pelvic anatomy seldom made possible positioning which put all three diameters in the same plane. It is also clear that the transverse diameter of the inlet is quite consistently farther from the film than the other two diameters.

Comment

The variability in results obtained with the two methods seems considerable. However, the precision of all pelvic measurements is subject to variations resulting from human error and inconsistency which may be of comparable magnitude. These result partly because an element of judgment enters into the selection of end points and partly because of other human inconsistency. The extent of this problem had been studied by Lilienfeld, Treptow and Dixon.[2] In this study, two individuals read a large series of pelvimetry films twice independently, and the consistency (or inconsistency) found in measuring the same film twice by one individual and the variations in results obtained by two individuals reading the same film was determined. The comparison between this variability and that shown between two methods as determined by this study, is shown in Table II. The data indicate that the differences shown by this study closely approximate the error inherent in all methods.

The isometric technique of Steele and Javert was used in the series reported on by Lilienfeld et al. These authors quoted Nicholson as reporting comparable errors associated with measurements obtained with his stereometric technique.

TABLE II. VARIABILITY BETWEEN METHODS COMPARED WITH ERRORS OF MEASUREMENT

	CS—Par (1)	A_1—A_2 (2)	A_1—B_1 (3)	*Standard Error of Measurement (4)
Transverse of inlet	0.35	0.24	0.40	0.28
Inter-spinous	0.22	0.30	0.38	0.27
Inter-tuberous	0.26	0.49	0.74	0.53

(1) Standard deviation of differences between Colcher-Sussman & Parallax method, present study.
(2) Standard deviation of the difference between A's first and second readings based on approximately 211 pelvimetry readings (from Lilienfeld et al.)
(3) Standard deviation of the difference between A's first and B's first readings based on approximately 104 readings (from Lilienfeld et al.)
(4) Standard error of measurement as calculated by Lilienfeld using formula: standard error equals $1/\sqrt{2}$ times corresponding figures in column 3.
*An estimate of the standard deviation of the error distribution o a series of readings by a single individual.

The measurements in this study for each method were taken from identical end points. Since this removed one variable in interpretation, it is probably not quite fair to conclude that the differences obtained by the two techniques could as logically be ascribed to human error as to any real difference in the two methods. It is also true that there is more consistent variation in the transverse diameter of the inlet than in the interspinous or intertuberous diameters, suggesting that there is a real difference between the methods with respect to this measurement. Nevertheless, it is clear that the variability in results obtained by the two methods under discussion is at least of the same order of magnitude as one would expect to occur with repeated measurement of the same set of films by one individual.

It seems fair to conclude then that, with the possible exception of the transverse diameter of the inlet, the differences in results in measuring transverse diameters of the pelvis by the two techniques described here can be as logically attributed to human error and inconsistency as to any real difference in the techniques. Since precision greater than that inherent in the interpretation of films regardless of technique is not real, it would seem logical to recommend the simpler technique.

Summary

A comparison between results in measuring transverse diameters of the obstetric pelvis by two x-ray techniques, that of Colcher and Sussman and

(Continued on Page 598)

Hennepin County Neonatal Mortality Study

1953 Report

THE Hennepin County Neonatal Mortality study is an analysis of all deaths occurring in Hennepin County in infants under twenty-eight days of age. The study, begun January 1, 1952, is a co-operative undertaking sponsored by the Hennepin County Medical Society, Minneapolis Pediatric Society, Minneapolis Health Department, Minneapolis Hospital Council, Departments of Pediatrics and Pathology of the Medical School of the University of Minnesota, and the Minnesota Department of Health. The committee working on the study is drawn from all these groups. The 1953 study is the second annual report.

The collaboration of all groups and specialties previously mentioned in the first report was continued. General practice, obstetrics, pediatrics, pathology, anesthesiology, roentgenology, and hospital administration have been represented on the committee. Physicians in private practice, teaching, and public health have added their knowledge to the analysis of the data. The study form has been carefully reviewed by the committee in order to make the records more accurate. The objective is to impress upon all the importance of obtaining and recording the pertinent data of the mother in pregnancy and labor and of the resulting offspring. It is hoped, too, that the completion of the forms will in itself be instructive.

Since our previous publication in July, 1954,[1] many reports have appeared in the literature. The American Medical Association has also established a clearing house for information for various states with Neonatal Mortality Committees. The problem of stillbirths was added to the scope of the Hennepin County Neonatal Mortality Committee in 1955, so that the designation of Hennepin County Perinatal Mortality Committee is now more appropriate. Analysis of stillbirths and neonatal deaths is very necessary in order to have a complete prenatal and postnatal picture.

The Committee in making the 1953 report will make comparisons with the 1952 report. Tables will be similar except for amplification to show neonatal deaths at various weights—below 1000 grams, 1000 grams—1499 grams, 1500 grams—1999 grams, 2000-2499 grams; 2500 grams and above will be considered full term. It should be noted that tables on congenital anomalies and parity have been omitted and will be considered in separate papers. It is hoped that those interested in the study will review the previous report. This background will enable the reader to compare the years 1952 and 1953. As was mentioned in 1952, the continuing decrease in infant mortality is encouraging, but the good example of other communities demonstrates that improvements can still be made.

In this analysis of neonatal deaths, it should be kept in mind that mortality and morbidity are different problems and that this is a study of mortality. Percentages in our tables concern the only data we have, namely, those on deaths. We have no statistics on live infants. It is therefore impossible to give the relationship of deaths to live births of the various causes or associated conditions in neonatal deaths.

The 1953 study includes 379 neonatal deaths (365 single births and seven pairs of twins) born of 372 mothers. Of the seven pairs of twins, five pairs were below 1000 grams and two pairs between 1000 and 1500 grams. The sex was 215 males (56.7 per cent) and 164 females (43.3 per cent). There were 379 neonatal deaths in 20,261 live births in Hennepin County in 1953, a rate of 18.7 neonatal deaths per 1000 live births.

Neonatal Deaths by Birth Weights

It is of interest that the figures for the percentage of deaths in the premature and full term infants are similar for both years; in 1952, 70.8 per cent premature and 28.5 per cent full term; in 1953, 71.2 per cent premature and 28.8 per cent full term. (Table I.)

In 1952 there were two cases (0.7 per cent) with no birth weight. Perhaps of note is a greater occurrence of deaths below 1000 grams in 1953,

---

Prepared by the Hennepin County Neonatal Mortality Study Committee, Minneapolis, Minnesota.

TABLE I. BIRTH WEIGHTS IN 1953 AND 1952

Weight	1953			1952	
	No.	Per Cent		No.	Per Cent
Less than 1000 Gm. (2 lb. 3 oz. or less)	119	31.3	71.2	236	70.8
1000-1499 Gm. (2 lb. 4 oz.—3 lb. 4 oz.)	60	15.8			
1500-1999 Gm. (3 lb. 5 oz.—4 lb. 6 oz.)	37	9.8			
2000-2499 Gm. (4 lb. 7 oz.—5 lb. 7 oz.)	54	14.3			
2500 Gm. and over (5 lb. 8 oz. and over)	109	28.8	28.8	95	28.5
Unknown				2	0.7
Total	379	100.0		333	100.0

119 cases (31.3 per cent) and in 1952, 91 cases (27.3 per cent). The neonatal death rate rose from 17.8 in 1952 to 18.7 in 1953. Prematurity is the major problem in neonatal deaths. Of particular concern is the problem of infants weighing below 1000 grams. This is the responsibility of those physicians providing obstetric care.

TABLE III(a) AGE OF MOTHERS BY INFANTS' BIRTH WEIGHT, 1953

Age of Mothers	Weight of Infant in Grams						
	Under 1000	1000-1499	1500-1999	2000-2499	2500 and Over	Total	Per Cent
19 and under	8	6	2	1	6	23	6.2
20-24	34	19	7	15	32	107	28.8
25-29	31	18	13	17	24	103	27.7
30-34	24	9	14	8	22	77	20.6
35-39	11	4	1	9	14	39	10.5
40 and over	3	2		4	3	12	3.2
Not recorded	3				8	11	3.0
Total	114	58	37	54	109	372	100.0

TABLE III(b) AGE OF MOTHERS BY INFANTS' BIRTH WEIGHT, 1952

Age of Mothers	Weight of Infant in Grams		Total	
	Under 2500 Gm.	2500 Gm. and Over	No.	Per Cent
19 and under	13	3	16	5.0
20-24	77	25	102	31.9
25-29	59	26	85	26.6
30-34	43	17	60	18.8
35-39	27	4	41	12.8
40 and over	2	1	3	0.8
Not recorded	4	9	13	4.1
Total	225	95	320	100.0

Autopsies

The higher number of deaths in prematures in 1953 was not matched by an increased percentage of autopsies (Table II). Whereas, in 1952, of prematures below 1000 grams 47.3 per cent had autopsies, in 1953, 33.6 per cent had autopsies. However, in 1953 the percentage of autopsies in full term infants was increased. Necropsies were obtained in about nine out of ten neonatal deaths in 1953, compared to about eight out of ten in 1952.

TABLE II. AUTOPSIES BY INFANTS' BIRTH WEIGHT IN 1953 AND 1952

Weight in Grams	1953			1952	
	Autopsies No./No. Infants	Autopsies Per Cent		Autopsies No./No. Infants	Autopsies Per Cent
Under 1000	40/119	33.6	51.9	122/238	51.3
1000-1499	31/60	51.7			
1500-1999	30/37	81.1			
2000-2499	39/54	72.2			
2500 and over	95/109	87.2	87.2	74/95	77.9
Total	235/379	62.0		196/333	58.9

The recognition of the necessity for autopsies is essential. The average doctor is impressed with the need of getting autopsies on larger infants, but, unfortunately, this will not give the complete picture. The doctor must revise his attitude and include the very small infants as well as the stillbirths in requesting autopsies. Even in babies weighing under 1000 grams (the so-called previable group) significant anatomic abnormalities may be found.

Much might be said about adequate autopsies—complete—inclusive of the head, with bacteriologic study when autopsies are done soon after death, and microscopic study of all organs. Perhaps more pathologists interested in the neonatal period would be the answer.

Ages of Mothers—Neonatal Deaths

The tables of distribution of deaths per age of mothers again appear to represent the distribution of total births (Tables IIIa and IIIb). This should not be misconstrued to mean that proportionally there are more deaths in infants of mothers of a certain age. There are more births at these ages. The 1953 tables show a more complete breakdown of deaths per weight of infant than the 1952 tables.

TABLE IV. MOTHERS' SEROLOGIC TEST FOR SYPHILIS BY INFANTS' BIRTH WEIGHT, 1953

Serologic Test Result	Infant Weight in Grams				
	Under 1000	1000-1499	1500-1999	2000-2499	2500 and Over
Positive		1*			1**
Negative	86	35	28	38	75
Not recorded	31	23	9	16	33
Per cent obtained	73.5	61.0	75.7	70.4	69.7

*Serologic test for syphilis positive 1942, penicillin given in this and previous pregnancy.
**Congenital lues, treated before pregnancy with 4,800,000 units penicillin over 10 days.

TABLE V. OBSTETRIC COMPLICATIONS BY INFANTS' BIRTH WEIGHT IN 1953 AND 1952

Complication	Weight of Infant in Grams, 1953						1952		
	Under 1000	1000-1499	1500-1999	2000-2499	2500 and Over	Total	Under 2500	2500 and Over	Total
Abruptio placentae	3	5	5	1	1	15	23	4	27
Antenatal bleeding Cause unknown	18	7	5	2	3	35	14	3	17
Placenta previa	2	5	3	3	1	14	12		12
Toxemia of pregnancy	8	2	2	2	5	19	13	5	18
Hypertension	(3)		(1)	(1)	(4)	(9)			
Polyhydramnios	2		1	2	3	8	6	4	10
Infection	8	2	2	1	3	16	10	3	13
Influenza	(4)	(1)			(3)	(8)	(8)	(3)	(11)
Appendicitis	(1)					(1)	(2)		(2)
Endocervicitis	(1)		(1)			(2)			
Polio during pregnancy	(1)		(1)			(2)			
Varicella at delivery		(1)				(1)			
Infectious hepatitis at delivery				(1)		(1)			
Gonorrhea at delivery	(1)					(1)			
Pelvic inadequacy		1		5	1	7			
Anemia	1				1	2	5		5
Diabetes					4	4	1	2	3
Prolapsed cord	1		3	2	3	9	1	2	3
Rheumatic heart disease	1			1		2	1		1
Infarction placenta	2	1	1			4			
Pleural effusion		1				1			
Fall on ice, week before delivery		1				1			
Bicornate uterus		1				1			
Total	46	26	22	19	25	138	86	23	109

In the group of infants weighing less than 1000 grams the lack of development of the lungs may be the deciding factor in the baby's death, according to Potter;[2] in the full term group of infants, congenital abnormalities account for most deaths. The cause of death among stillbirths is still undetermined and awaits further reports.

Syphilis

Serologic tests for syphilis were done in 264 of the 372 mothers in this study (72.5 per cent) (Table IV). Two of these mothers had positive serology and received adequate antiluetic therapy during their pregnancies. Neither of the infants of these mothers had evidence of syphilis at autopsy.

Obstetric Complications

In the 1953 Hennepin County report of 372 mothers and 379 offspring, obstetric complications were encountered in 138 pregnancies, or 37 per cent, as compared with 34 per cent in 1952 (Table V). Again, in almost two-thirds of the pregnancies there were no known obstetric abnormalities. As in the previous reports, obstetric complications, mostly abruptio placentae, placenta previa, undiagnosed types of antenatal bleeding and toxemia, were considerably more common in the premature deliveries.

In thirty-five cases of antenatal bleeding the causes were listed as unknown. It is felt that a definite diagnosis should have been made in most of these cases. The main causes of antepartum bleeding are abruptio placentae and placenta previa. In 1952 only seventeen cases of antenatal bleeding were considered as cause unknown. Polyps, bleeding erosion, and carcinoma can be ruled out by speculum examination. It is remarkable that only one full term infant was lost from placenta previa in 1953. The chief causes of intrauterine anoxia (the main cause of fetal loss) are placenta previa and abruptio placentae. Where there is bleeding late in pregnancy, especially placenta previa, an expectant type of management with sensible precautions does not compromise the mother's safety. In the interest of the fetus and the avoidance of fetal wastage, the best possible procedure is prolonged gestation to the relatively safe period of thirty-six weeks and beyond. All placentas should be carefully examined after delivery for evidence of pathology.

(Turn to Page 589)

Now Available

7 Years Sickness Benefits

(HOUSE CONFINEMENT NOT REQUIRED)

Lifetime Accident Benefits

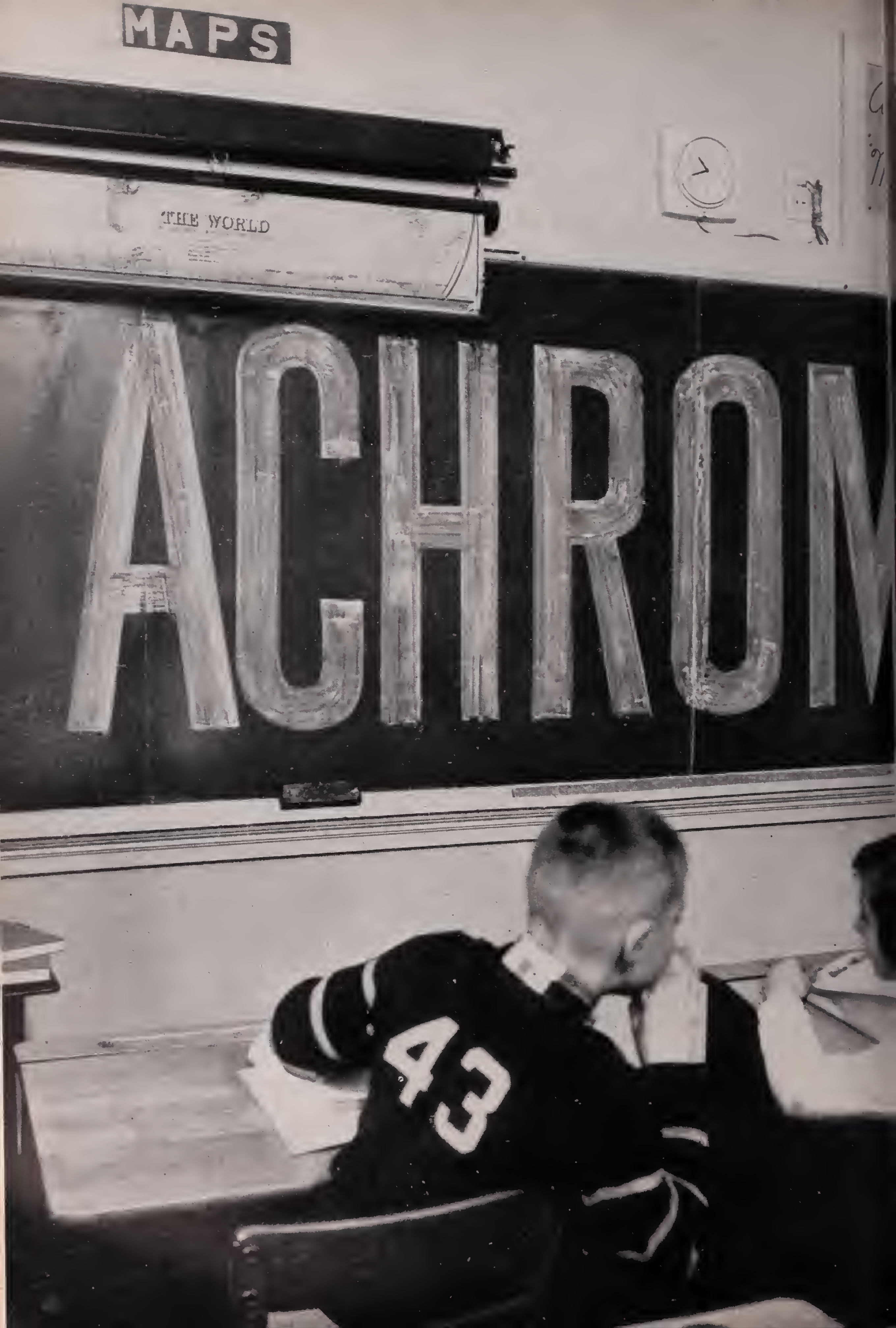
This extension of benefits is now available to you as a member of the Minnesota State Medical Association. Since December, *1947,* the inception date of our plan for members of your Association, the Caswell-Ross Agency has attempted at all times to secure for you the finest coverage in the accident and sickness field. These improvements will make your policy the best among many available to you. An application has been sent to you previously—why not complete and return it to our office now.

CASWELL-ROSS AGENCY

1177 N. W. Bank Building Minneapolis 2, Minnesota
Minneapolis—FE 2-2585 St. Paul—MI. 5-7004

Administrators of Professional Disability Plans

Minnesota State Bar Association
Minnesota State Dental Association
Minnesota Society of C. P. A.
Minnesota State Pharmaceutical Assn.
Minnesota Auto Dealers Association
Minnesota Federation of Eng. Societies
Minnesota State Veterinary Medical Soc.
Hennepin County Medical Society
Hennepin County Bar Association
11th Judicial Bar Association
Minneapolis Association of Life Underwriters
Minnesota State Life Underwriters Assn., Inc.
Ramsey County Medical Society
Ramsey County Bar Association
St. Paul District Dental Soc.
Minneapolis District Dental Soc.
St. Cloud Dental and Stearns County Medical Society
Duluth District Dental Society
East Central Medical Society
St. Louis County Medical Society
West Central Dist. Dental Society
Northwest Proprietors Association
St. Paul Life Underwriters, Inc.


MAPS
THE WORLD
ACHROM
43

DdEeFfGgHhIiJjKkL
OoPpQqRrSsTtUuVvW
XxYyZz
1234567890
YCIN*

ACHROMYCIN*

Tetracycline *Lederle*

in the treatment of

respiratory infections

January and his associates[1] have written on the use of tetracycline (ACHROMYCIN) to treat 118 patients having various infections, most of them respiratory, including acute pharyngitis and tonsillitis, otitis media, sinusitis, acute and chronic bronchitis, asthmatic bronchitis, bronchiectasis, bronchial pneumonia, and lobar pneumonia. Response was judged good or satisfactory in more than 84% of the total cases.

Each month there are more and more reports like this in the literature, documenting the great worth and versatility of ACHROMYCIN. This antibiotic is unsurpassed in range of effectiveness. It provides rapid penetration, prompt control. Side effects, if any, are usually negligible.

No matter what your field or specialty, ACHROMYCIN can be of service to you. For your convenience and the patient's comfort, Lederle offers a *full* line of dosage forms, including

ACHROMYCIN SF

ACHROMYCIN with STRESS FORMULA VITAMINS. Attacks the infection—defends the patient—hastens normal recovery. For severe or prolonged illness. Stress formula as suggested by the National Research Council. Offered in Capsules of 250 mg. and in an Oral Suspension, 125 mg. per 5 cc. teaspoonful.

For more rapid and complete absorption. Offered only by Lederle!

dry-filled sealed capsules

---

[1] January, H. L. et al: Clinical experience with tetracycline. *Antibiotics Annual* 1954-55, p. 625.

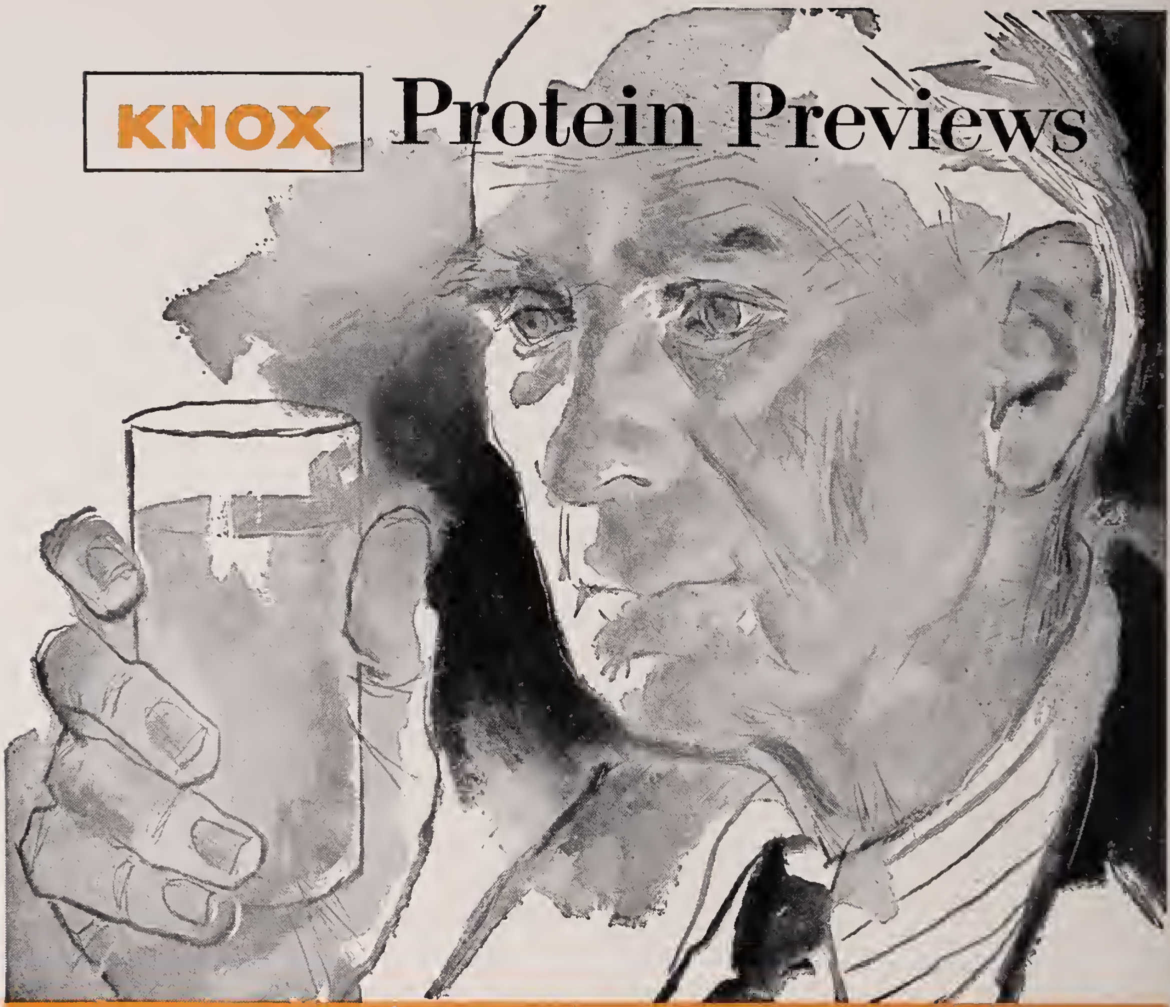
Lederle

LEDERLE LABORATORIES DIVISION
AMERICAN CYANAMID COMPANY
PEARL RIVER, NEW YORK

*REG. U. S. PAT. OFF.

PHOTO DATA: 8 X 10 VIEW CAMERA—WIDE ANGLE LENS,
F.32, 1/10 SEC., FLOODS AND SPOTS, ROYAL PAN FILM

KNOX Protein Previews



Maintaining Lean Body Mass in the Edentulous Geriatric Patient

KNOX
32
UNFLAVORED
GELATINE

Extensive loss of body protein can occur in either the spare or obese geriatric patient. But whatever the patient's somatotype, a decrease in lean body mass is usually the result of inadequate protein intake due to poor dentition, slowed-down digestion and quite frequently, unappetizing main dishes.

Knox Gelatine is an excellent non-residue protein which is easy to chew and readily digested and assimilated. As a vehicle for many foods, Knox Gelatine brightens bland diets, giving a new interest to jaded appetites. As a concentrated protein drink, Knox Gelatine supplies seven out of eight essential amino acids and a majority of the other amino acids composing protein.

Specific suggestions on how to use Knox Gelatine in different types of geriatric diets are described in the booklets listed in the coupon below.

Chas. B. Knox Gelatine Company, Inc.
Professional Service Department SJ-18.
Johnstown, N. Y.

Indicate number of special diet booklets desired for your patients opposite title:

GERIATRIC__________ REDUCING__________
DIABETIC__________ CONVALESCENT__________

YOUR NAME AND ADDRESS

Type of Delivery

Further reduction in neonatal mortality requires improvement of prenatal care, starting early in pregnancy. Early detection and adequate treatment of anemia with maintenance of proper nutrition should be emphasized.

TABLE VI. TYPES OF DELIVERY BY INFANTS' BIRTH WEIGHT IN 1953 AND 1952

Type of Delivery	Weight of Infant in Grams, 1953							1952			
	Under 1000	1000-1499	1500-1999	2000-2499	2500 and Over	Total		Under 2500	2500 and Over	Total	
						No.	Per Cent			No.	Per Cent
Cephalic	74	29	24	32	88	247	65.2	131	69	200	60.1
Breech	39	24	7	8	12	90	23.7	69	8	77	23.1
Version and extraction		2		3	5	10	2.7	1	2	3	0.9
Cesarean section	6	5	6	11	4	32	8.4	23	9	32	9.6
Unknown								14	7	21	6.3
Total	119	60	37	54	109	379	100.0	238	95	333	100.0

TABLE VII(a) MOTHERS' RH DETERMINATIONS BY INFANTS' SPECIFIC BIRTH WEIGHT, 1953

Rh Determination	Weight of Infant in Grams					
	Under 1000	1000-1499	1500-1999	2000-2499	2500 and Over	Total
Rh positive	62	32	25	35	54	208
Rh negative	13	1	4	5	23	46
Rh not recorded	39	25	8	14	32	118
Total	114	58	37	54	109	372
Per cent Rh Determinations obtained	65.8	56.9	78.4	74.1	70.6	68.3

TABLE VII(b) MOTHERS' RH DETERMINATIONS IN 1953 AND 1952

Rh Determination	1953		1952	
	No.	Per Cent	No.	Per Cent
Rh positive	208	55.9	171	53.4
Rh negative	46	12.4	52	16.3
Rh not recorded	118	31.7	97	30.3
Total	372	100.0	320	100.0
Per cent obtained	68.3		69.7	

In the whole group of deliveries, about 65 per cent were cephalic and 24 per cent were breech, closely approximating the 1952 report (Table VI). Immature births are frequently associated with breech deliveries which decrease in frequency with increase in birth weight. Cesarean sections contributed 8.4 per cent of neonatal deaths. The avoidance of podalic version and difficult midforceps deliveries with studied management of mid-pelvic contractions is advised. Particular care must be exercised in delivery of the premature breech. Great discretion is necessary in the choice of minimal obstetric analgesia and anesthesia. Saddle block anesthesia is often of value. Early diagnosis of multiple gestation with restriction of activities in such cases from the seventh month is recommended.

Erythroblastosis Fetalis

The Rh factor was determined in only 70 per cent of mothers whose babies died, but it should be determined in all pregnancies. There were no ABO incompatibilities reported in this study. The breakdown by weight shows a somewhat larger proportion of the Rh determinations not done in mothers of infants below 1500 grams (Table VIIa). This might be due to the mothers not seeing the physician before onset of labor. Of the total Rh determinations in the 1953 study 81.9 per cent of the mothers were Rh positive and 18.1 per cent were Rh negative. In the 1952 study, 23.4 per cent of mothers were Rh negative. There is insufficient Rh data on the husbands of Rh negative mothers, and necessary Rh data in children and fathers has not been receiving sufficient attention. It is felt that the Rh test should be repeated during subsequent pregnancies because of occasional laboratory errors, especially when done prior to 1952. The value of antibody titre determinations in predicting the status of the fetus *in utero* is now being questioned by some authorities. Because of the reasoning that the major damage to fetal erythrocytes by maternal antibodies occurs in the last month of pregnancy, it formerly was advocated that pregnancy should be terminated about the eighth month. This procedure is no longer favored, as it is thought that the hazards of prematurity and the chances of getting a defective child outweigh the possibility of additional damage occasioned by longer exposure to maternal antibodies. Babies sensitized to the Rh factor do not tolerate prematurity well.

To promote fetal salvage, preparations should be made for immediate blood typing and Coomb's test on the cord blood, with exchange transfusions when indicated. The hemoglobin level (in grams) and the red blood count should be closely observed. Bilirubin levels should be done on the cord and repeated later on the infant.

TABLE VIII. INDICATIONS FOR CESAREAN SECTION BY INFANTS' BIRTH WEIGHT IN 1953 AND 1952

Indication for Cesarean Section	Weight of Infant in Grams, 1953						1952		
	Under 1000	1000-1499	1500-1999	2000-2499	2500 and Over	Total	Under 2500	2500 and Over	Total
Toxemia	6	1	2		1	10	8	1	9
Placenta previa		2	2	2	1	7	5		5
Abruptio placentae		1	1	1		3	2		2
Contracted pelvis		1*		4*		5	3	3	6
Post-mortem			1			1			
Rh incompatibility				1	2	3		1	1
Prolapsed cord				2		2			
Previous Cesarean section				1*		1	3	1	4
Diabetes								2	2
Breech							1	1	2
Osteomyelitis hips							1		1

*elective.

TABLE IX(a) DURATION OF LIFE BY INFANTS' BIRTH WEIGHT, 1953

Duration of Life	Weight of Infant in Grams								Total	
	Premature						Full Term			
	Under 1000	1000-1499	1500-1999	2000-2499	Under 2500		2500 and Over			
					No.	Per Cent	No.	Per Cent	No.	Per Cent
Under 1 hour	17	5	5	7	34	12.6	11	10.1	45	11.9
1-24 hours	71	35	16	19	141	52.2	36	33.0	177	46.7
25-48 hours	16	16	8	14	54	20.0	24	22.0	78	20.6
2-7 days	14	2	6	10	32	11.9	26	23.9	58	15.3
8-28 days	1	2	2	4	9	3.3	12	11.0	21	5.5
Total					270	100.0	109	100.0	379	100.0

Cesarean Section

Again the relatively high incidence of cesarean sections in neonatal deaths was due to obstetric complications (Table VIII). There were thirty-two sections, or 8.4 per cent. Most of these were done to deliver an immature infant of 1000-2500 grams (twenty-two cases), especially for emergency section in placenta previa or abruptio placentae. In six instances a section was done for toxemia of pregnancy with the fetus weighing 1000 grams or under. The four full term neonatal section deaths were due in two instances to Rh incompatibility, plus one instance each from toxemia and placenta previa.

There were six neonatal deaths associated with elective section, all of which were immature. It was felt that in several cases there was a definite error of judgment in the timing of the repeat elective section. When they are premature, many elective section babies do not do well. The physician should use all available methods at his command to evaluate fetal age preoperatively. The frequency of miscalculation on the basis of the last menstrual period is well known. Elective section must be avoided unless the child is sufficiently large. Prevention of premature delivery would be possible by doing the section at or only a few days prior to term.

TABLE IX(b) DURATION OF LIFE BY INFANTS' BIRTH WEIGHT, 1952

Duration of Life	Weight of Infant in Grams				Total	
	Under 2500 Gm.		2500 and Over			
	No.	Per Cent	No.	Per Cent	No.	Per Cent
Under 1 hour	34	14.3	6	6.3	40	12.0
1-24 hours	126	52.9	29	30.5	155	46.5
25-48 hours	32	13.4	15	15.8	47	14.2
2-28 days	46	19.4	45	47.4	91	27.3
Total	238	100.0	95	100.0	333	100.0

Early detection or treatment of toxemia factors should be emphasized. Near term there is no problem other than the method of delivery. One should attempt to carry the pregnancy through the thirty-third or thirty-fourth week to increase, f possible, the premature survival rate. Prior to his time a true toxemia patient poses a serious roblem. Many fetuses die *in utero* after two or hree weeks of persistent toxemia. Prolongation of pregnancy may cause serious fetal and maternal damage.

The type of analgesia, preoperative medication and anesthesia employed in a section greatly influence the condition of the fetus. Asphyxiating anesthesia should be avoided. Conduction anesthesia is being used more frequently by physicians because of the possible deleterious effect of general anesthesia on the infant. Many prefer local or spinal anesthesia with oxygen inhalation until the infant is delivered when some administer intravenous penthothal during closure. Local anesthesia is generally considered the safest for the infant. Inhalation is still preferred by some when administered safely by a well controlled team in competent hands.

Duration of Life

The duration of life in premature infants was under one hour in 12.6 per cent; one to twenty-four hours, 52.2 per cent; twenty-five to forty-eight hours, 20.0 per cent; two to seven days, 11.9 per cent; eight to twenty-eight days, 3.3 per cent (Table IXa). In full term infants the respective percentages were 10.1, 33.0, 22.0, 23.9 and 11.0. Of all neonatal deaths in 1953, 11.9 per cent died within the first hour, 58.6 per cent died during the first twenty-four hours, almost 80 per cent within the first forty-eight hours and 95 per cent within the first seven days. These percentages are similar to the 1952 study (Table IXb).

TABLE X(a) CAUSES OF DEATH BY INFANTS' BIRTH WEIGHT, 1953

Cause of Death	Weight of Infant in Grams					Total	
	Under 1000	1000-1499	1500-1999	2000-2499	2500 and Over	No.	Per Cent
Abnormal pulmonary ventilation	109	51	26	21	22	229	60.5
Immaturity unqualified	(80)	(20)	(8)	(4)	(0)	(112)	(29.6)
Atelectasis	(27)	(17)	(11)	(8)	(15)	(78)	(20.6)
Hyaline membrane disease	(2)	(14)	(7)	(9)	(7)	(39)	(10.3)
Congenital anomalies	3	5		14	40	62	16.4
Anoxia				5	2	7	1.8
Infection	0	3	5	4	14	26	6.9
Pneumonia		(3)	(3)	(3)	(11)	(20)	(5.3)
Septicemia			(2)	(1)	(3)	(6)	(1.6)
Blood dyscrasias							
Erythroblastosis fetalis			1	5	14	20	5.3
Birth trauma							
Intracranial hemorrhage	7		3	3	11	24	6.3
Other		1	2	2	6	11	2.8
Total	119	60	37	54	109	379	100.0

TABLE X(b) ANALYSIS OF CAUSES OF DEATH BY INFANTS' BIRTH WEIGHT, 1952

Cause of Death	Premature		Full Term		Total	
	Number	Per Cent	Number	Per Cent	Number	Per Cent
Abnormal pulmonary ventilation	165	69.3	14	15.0	179	53.7
Immaturity unqualified	(50)	(21.0)			(50)	(15.0)
Congenital anomalies	27	11.4	40	42.1	67	20.1
Anoxia (fetal and unspecified)	15	6.3	9	9.4	24	7.2
Infection	12	5.0	10	10.5	22	6.6
Birth trauma	7	2.9	6	6.2	13	3.9
Blood dyscrasias	5	2.1	13	13.7	18	5.4
Other	7	2.9	3	3.1	10	3.0
Total	238	99.9	95	100.0	333	99.9

Causes of Death

It is of note how similar the percentages are for causes of death in 1952 and 1953 (Tables Xa and Xb). In 1952, abnormal pulmonary ventilation accounted for 53.7 per cent of the deaths; in 1953, 60.5 per cent of deaths. In 1952, only 15.0 per cent of cases were classified as immaturity unqualified compared to 29.6 per cent in 1953. This may be accounted for by the larger proportion of deaths under 1000 grams (in 1953, 31.3 per cent of deaths below 1000 grams; in 1952, only 27.3 per cent). Congenital anomalies caused 20.1 per cent of deaths in 1952 and 16.4 per cent in 1953. It is interesting to compare the deaths due to anoxia, 7.2 per cent in 1952 and only 1.8 per cent in 1953. The percentage of deaths due to infection is almost identical in both years, 6.6 per cent in 1952, and 6.9 per cent in 1953. Birth injury is more frequent in the 1953 series, 6.3 per cent as against 3.9 per cent in 1952. This may be accounted for by the number of deaths in infants below 1000 grams. Blood dyscrasias accounted for 5.4 per cent of deaths in 1952 and 5.3 per cent of deaths in 1953. "Other causes" were 3.0 per cent in 1952 and 2.8 per cent in 1953. In 1953 the eleven cases listed under "other causes" included bilateral pneumothorax, tetany of the newborn and undetermined causes of death in full term infants.

Preventable Deaths

There were seventeen obstetric, two obstetric-pediatric, and nine pediatric preventable deaths in 1953, which are broken down by infant weight groups below. Thus 7.4 per cent were rated as preventable deaths.

Below 1000 Grams

No obstetric or pediatric preventable deaths.

1000-1499 Grams

1. One Obstetric Preventable Death.

A twenty-three-year-old mother had three previous pregnancies, two full term and one premature infant. She had previously had a cesarean section for a generally contracted pelvis and was electively sectioned at thirty-one weeks of gestation. Anesthesia included nitrous oxide, ethylene, cyclopropane for five minutes before delivery. The infant weighed 3 pounds ¼ ounce, had poor color and grunting respirations, and lived for twenty-four hours. Autopsy of the infant disclosed bilateral atelectasis and hyaline membrane disease of the lungs.

2. No Pediatric Preventable Deaths.

1500-1999 Grams

1. Three Obstetric Preventable Deaths.

A twenty-four-year-old mother, who had previously had one full term infant and two miscarriages, had vaginal bleeding for one and one-half days in the second month of pregnancy. At thirty-six weeks of gestation she was electively induced with intravenous pitocin and rupture of the membranes. The infant weighed 4 pounds, ½ ounce, had dusky color and rapid shallow respirations, and lived for ten hours, eighteen minutes. Autopsy of the infant disclosed bilateral atelectasis and hyaline membrane disease of the lungs.

A thirty-three-year-old mother, who had previously had three full term infants, had several episodes of spotting during the second half of the pregnancy. After two hours and thirty-five minutes of labor, during which she received nitrous oxide, ethylene, and cyclopropane anesthesia for one hour, she delivered a 4 pound, 4 ounce infant that did not breathe for the first ten minutes and then only gasped about once per minute for thirty-five minutes. Autopsy of the infant disclosed bilateral atelectasis of the lungs.

A thirty-year-old Rh positive mother had previously had two full term infants, one premature, and one miscarriage. The first stage of labor lasted five hours and the presentation was vertex with the infant's hand in front of the head. The cord was prolapsed. No consultation was sought. Anesthesia was nitrous oxide for five minutes. The infant, weighing 4 pounds 3½ ounces, was cyanotic and its respirations were shallow and poor. The infant was placed in an Air-lock and expired after five and one-half hours. Autopsy disclosed prolonged anoxia manifested by petechial hemorrhage in the viscera and serous surfaces, moderately severe fetal atelectasis, and increased hematopoiesis in the liver, cause unknown.

2. Two Pediatric Preventable Deaths.

A thirty-three-year-old mother (three previous full term infants, two previous prematures) had four weekly prenatal visits starting at the seventh month. Following three hours and twenty minutes of labor (no anesthesia mentioned), she gave birth to twins. The first twin lived and is not further mentioned. The second twin was a breech presentation and the color was cyanotic. At birth it was noted that the infant had a right harelip, cleft palate and a right club foot. Sternal retraction was present and the lungs were clear to percussion and auscultation. After twenty-nine hours the infant was offered 5 per cent solution of glucose in water by a medicine dropper. The sternal retraction persisted although at three days of age lungs were clear to percussion and auscultation. The infant then began having intermittent bouts of apnea, which were treated with suctioning and caffeine sodium benzoate with some improvement. The infant expired at three days of age. Antibiotics were not given. Autopsy disclosed bronchopneumonia (no cultures obtained at autopsy).

A thirty-three-year-old mother (three full term infants, two prematures) had toxemia on her first and fourth pregnancy, but not during the present pregnancy. Vaginal bleeding and rupture of the membranes occurred three days before delivery, at which time the blood pressure and urine were normal. The mother was admitted to the hospital, given bed rest and penicillin, and after two hours of labor delivered a 3 pound, 5½ ounce infant under interval nitrous oxide and oxygen anesthesia for eight minutes. The placenta showed signs of premature separation along one edge. The infant's color was fairly good, respirations labored with deep substernal retraction. The infant had four bloody stools during the first two days of age, no bloody stools subsequently. At four days of age the respirations continued to be labored and color became gray. Nine hours before death (the fourth day) the infant received 300,000 units of S.R. penicillin. A portable x-ray showed incomplete expansion of the right lung base. The respirations became more shallow and finally ceased. Autopsy disclosed aspiration of infected amniotic fluid, pneumonitis, and a terminal massive suppurative meningitis, nonspecific. No cultures were done.

2000-2499 Grams

1. Five Obstetric Preventable Deaths.

A thirty-two-year-old mother (two previous full term infants) with a platypelloid pelvis (true conjugate 10 cm.) and previous cesarean section had an elective section under local anesthesia at forty-one weeks of gestation. The infant weighed 4 pounds, 12 ounces, the color was initially good but became cyanotic, and chest x-ray showed ground glass density of both lungs. Respirations continued to be poor and the infant expired at thirty-nine hours. No autopsy was done. The cause of death was listed as congenital atelectasis.

A twenty-six-year-old primigravida had a normal pregnancy with the first stage of labor lasting six hours. Presentation was transverse. No consultation was sought. Version and extraction was done with five minutes of cyclopropane anesthesia before delivery. The second stage of labor lasted twenty-five minutes. The infant, the second of twins, weighed 5 pounds, 7½ ounces, and a cleft palate was present. It had no difficulty until the second day when cyanosis occurred which progressed until death at three days of age. An x-ray of the chest ruled out diaphragmatic hernia. Autopsy disclosed bilateral tearing of the tentorium with subtentorial hemorrhage and hemorrhage into the region of the third ventricle.

A twenty-eight-year-old mother (one previous full term infant born by cesarean section because of a previous history of fractured pelvis with a suspected disproportion) had an elective section under cyclopropane and ethylene anesthesia at thirty-seven weeks of gestation The infant weighed 5 pounds, 7½ ounces and received penicillin, humidity and oxygen in the incubator. The skin became cold, clammy and the respirations gradually became more shallow. A chest x-ray showed bilateral patchy areas of atelectasis. The infant expired at twenty-four hours of age. Autopsy disclosed bilateral hyaline membrane disease of the lungs.

A twenty-five-year-old mother (one previous full term infant) had elective forceps delivery OP to OA because of a face presentation and failure of rotation. No consultation was sought. The first stage of labor lasted four and one-fourth hours and the second stage twelve minutes. Delivery was under cyclopropane anesthesia (duration not stated). The infant weighed 5 pounds, 6 ounces, was waxy and pale (asphyxia pallida), had a painful high pitched cry with each breath, and ecchymotic areas were present over the head. Respirations continued to be poor with retraction noted. The infant died at twenty-five hours of age and autopsy disclosed birth trauma (marked hemorrhage and minimal tearing of the falx cerebri and tentorium cerebelli with mild subarachnoid hemorrhage in the occipital area). Bilateral atelectasis of the lungs was also present.

A thirty-year-old mother (one previous full term infant, one premature) had no prenatal care during the present pregnancy. She was admitted to the hospital in active labor with unruptured membranes. She was taken to the delivery room where it was found that the cervix was not dilated and only 50 per cent effaced. X-ray showed a shoulder presentation. Two hours following admission the membranes ruptured spontaneously, the cord prolapsed, and the fetal heart tones became faint. Instead of immediate cesarean section, there was a delay of one hour and thirty minutes during which the cord was replaced into the uterus by sterile vaginal manipulation. Cyclopropane anesthesia was given for fifteen minutes before delivery. There were no efforts at respiration by the infant who lived thirty seconds (heart beat only sign of life). The infant weighed 5 pounds, 6 ounces, and the cause of death was listed as immaturity.

2. Three Pediatric Preventable Deaths.

A forty-year-old mother (one previous full term infant by cesarean section for contracted pelvis) had an elective section at forty weeks under local anesthesia. The infant weighed 5 pounds, 3 ounces, and was pink at birth but became cyanotic on the way to the nursery. It had a good color in the Air-lock but became unusually cyanotic on removal from it. The physician decided that the condition of the infant was too critical to permit x-ray study. The child became more exhausted due to labored respirations and expired at twenty-eight hours. An autopsy disclosed a congenital cyst (12x12x18 mm.) of left lung with rupture, emphysema of lung and posterior mediastinum, pneumothorax, and hemorrhage due to anoxia. The right lung was extensively atelectatic.

A thirty-year-old mother (two previous full term infants) was Rh negative with an Rh positive husband. No Rh antibodies were present until five days before delivery when the albumin test was 1:4. Following a labor of six hours the infant was delivered by low forceps and weighed 4 pounds, 14 ounces. The infant appeared normal at birth and had a normal hemoglobin. During the next three days, however, it developed rapidly increasing icterus and appeared weaker and showed evidence of spasticity in the extremities. An exchange transfusion was not done until the third day of life when 250 cc. of blood was administered and 220 cc. removed. No laboratory work was recorded except the initial normal hemoglobin, and the infant expired at four days of age. Autopsy disclosed erythroblastosis fetalis and kernicterus.

A forty-three-year-old mother (four previous full term infants) had a severe fall on the ice at the third lunar month. The first stage of labor was approximately one and one-half hours and the presentation was footling breech. The second stage of labor was thirty minutes and there was no cord pulsation present. Manual dilitation of the cervix was done after the breech and the body was born. No consultation was sought. The infant weighed 5 pounds, 6 ounces, and had no heart action until intracardiac adrenalin was given along with tracheal intubation and suction. The baby remained in coma with irregular gasping respirations. Feedings were started at two days of age and taken fairly well until death at seven days of age. Penicillin was given, amount not stated. Autopsy disclosed aspiration pneumonia, multiple pulmonary abcesses and necrotic nodule in the left adrenal gland. No blood cultures were done.

2500 Grams and Over

1. Eight Obstetric Preventable Deaths.

A thirty-year-old primigravida had mild toxemia (blood pressure 140/90). Measurements were interspinous 27 cm., intercrestal 29 cm., intertuberous 32 cm., external conjugate 20½ cm., diagonal conjugate 12 + cm, bituberous 8½ cm. Labor was spontaneous, with the first stage fourteen hours and forty-five minutes and second stage one hour and ten minutes. Delivery was vertex, low forceps, under cyclopropane, ethylene, and nitrous oxide anesthesia. The infant did not breathe for two to three minutes and was given coramine; breath sounds were poor and the cry was feeble. The baby weighed 8 pounds, 4½ ounces, and lived five hours. Autopsy disclosed bilateral subdural hematomas and a tear in the left side and anterior edge of the tentorium cerebelli.

A twenty-four-year-old primigravida had a normal pregnancy and spontaneous labor, first stage four hours, and second stage fifteen minutes. Measurements were interspinous 23 cm., intercrestal 27 cm., external conjugate 20 cm., diagonal conjugate 12+cm., posterior sagittal 5 cm. Delivery was by breech with forceps to the aftercoming head and anesthesia by means of 1 per cent novocain infiltration and nitrous oxide for five minutes. The infant, weighing 6 pounds, 1½ ounces, gave the first cry at two minutes, and lived for forty-six hours. Autopsy disclosed edema of the scalp and periosteum, extensive laceration of both tentoria with intracranial hemorrhage, and aspiration of meconium.

A thirty-nine-year-old mother (one previous full term infant) had a normal pregnancy and spontaneous labor, first stage six hours and thirty minutes, and second stage one hour and fifty-nine minutes. Presentation was ROP and elective mid-forceps rotation was done to OA. No consultation was sought. Anesthesia was by novocain saddle block. The infant was the second of twins, weighed 7 pounds, 5 ounces, was cyanotic, and had gasping respirations. He lived for twenty-eight hours. Autopsy disclosed bilateral tentorial tears with supratentorial and subtentorial hemorrhage.

A twenty-four-year-old primipara had a normal pregnancy and spontaneous labor, first stage seven hours and fifty minutes, second stage seventeen minutes. Presentation was ROA. At 4:25 A.M., three hours before delivery, the mother was given a paracervical block for backache with 1 per cent cyclaine (31 cc.). About fifteen minutes after the block, the blood pressure became unobtainable and the patient was cold and clammy. The fetal heart rate fell to 70 to 80 and remained so for an hour. At 5:00 A.M. the mother was given 25 mg. ephedrine sulphate, 500 cc. 5 per cent sodium chloride in water with levophed, and her blood pressure rose to 110, with pulse 120. Labor then progressed normally and the infant, delivered by low forceps, weighed 7 pounds, 14½ ounces. He began to cry at about two and one-half minutes and began to have normal respirations at about ten and one-half minutes. The respirations then became jerky and the infant expired at twenty hours of age. Autopsy disclosed purulent pneumonitis. No antibiotics were administered.

A twenty-year-old mother (one previous full term living infant) had a normal pregnancy and spontaneous labor, first stage six hours, second stage twenty minutes. Presentation was shoulder and the infant was born breech, after version with inability to extract the head through an undilated cervix. Ether anesthesia was used (twenty minutes' duration). The infant weighed 6 pounds, 6 ounces, was flaccid at birth, did not breathe, but the heart beat slowly for eight minutes. No autopsy was done. Cause of death was listed as cerebral trauma with anoxia.

A thirty-nine-year-old mother (three previous full term living infants) was Rh negative and during her third pregnancy the anti-Rh titre rose to 1:28 at seven months. The anti-Rh titre was negative during the present pregnancy. The mother had a threatened abortion at three to five months, treated by bed rest, proloid and stilbestrol. The membranes ruptured five days before delivery. No antibiotics were given. The mother had spontaneous labor, first stage two to three hours, second stage ten minutes. Local 1 per cent novocaine anesthesia was used along with nitrous oxide and oxygen at intervals. Presentation was LOA. The infant weighed 5 pounds, 9 ounces, breathed and cried spontaneously. The infant's hemoglobin was 140 per cent, Coombs test was negative. The respirations became irregular and gasping. No antibiotics were given. The infant expired at six hours and nineteen minutes of age. Autopsy disclosed pneumonia with aspiration of infected amniotic fluid. *E. coli* organisms were cultured from the lungs.

A twenty-nine-year-old primigravida was diabetic. Pelvic measurements were normal and prenatal care was uneventful. Labor was spontaneous, presentation was frank breech, first stage lasted six hours, second stage one hour. About forty minutes before birth, the cord prolapsed and the fetal heart tones fell to eighty per minute. No consultation was sought. Cyclopropane anesthesia was given for thirty minutes continuously before birth. The infant weighed 6 pounds, 6½ ounces, condition was poor with gasping respirations and slow heart beat. The infant was given oxygen, 1 cc. metrazol, and placed in an Air-lock, but died after four hours and forty minutes. Autopsy disclosed hemorrhages in capsular surfaces (pleura, epicardium, pericardium adrenal), gross pulmonary hemorrhage, and hyperplastic pancreatic islets.

A thirty-one-year-old primigravida had hypertension from the onset of pregnancy. The urine was negative for albumin until the last month when it was 1+. No records were available as to treatment. The mother was admitted to the hospital on the day before delivery. Blood pressure was 160/100; urine albumin was 3+. Pitting edema was present. Labor was spontaneous, first stage twelve hours, second stage one and one-half hours. The mother had a convulsion one and one-half hours before delivery of the first of twins. Sodium amytal 3¾ grains i.v. was given. No consultation was sought. Anesthesia was nitrous oxide and oxygen. The first twin lived. The second twin was cephalic presentation and high forceps were used. He weighed 7 pounds, 7½ ounces, condition was very poor, and the infant cried two minutes after delivery. The color again became dusky after one hour and respirations were one per minute. Adrenalin and alpha-lobeline vere given and the infant was laryngoscoped and put in he Air-lock. No antibiotics were given. Temperature ose to 105.8° (R) ten hours after birth and a high hrill cry was present along with twitching. The infant expired at sixteen hours and sixteen minutes of age. Autopsy disclosed atelectasis and pulmonary hemorrhage. The mother was in critical condition for wo days following delivery, then had a normal recovery.

2. *Two Obstetric-Pediatric Preventable Deaths.*

A twenty-one-year-old mother (one full term living nfant, one abortion) had three blood transfusions given after the first delivery. She was thought to be Rh positive at the first delivery, but was found to be Rh negative after the birth of the present baby. The father was Rh positive. The mother had an uneventful pregnancy and spontaneous labor, first stage three hours, eighteen minutes, second stage twenty minutes. Caudal anesthesia was started two hours before delivery and pitocin, 1 minim, was given thirty minutes before delivery. Presentation was ROA, outlet forceps were used. The infant weighed 6 pounds, 13½ ounces, and breathed immediately, although the color was poor and the infant became flaccid and cyanotic. On physical examination moist rales were heard throughout the lungs and a loud systolic heart murmur was heard. A large mass in the abdomen was thought to be the liver. The clinical impression originally was congenital heart disease with decompensation. Laboratory work done on the day of birth revealed a hemoglobin of 5 grams, WBC 33,500, 701 normoblasts per 100 WBC, blood group O, Rh positive (CDe), direct Coombs 1 plus, indirect Coombs 1:128, D albumin 1:64. The diagnosis was considered to be erythroblastosis. The physician felt that the baby could not tolerate an exchange transfusion. The infant received 15 cc. of blood i.v. on the day of birth, later another 50 cc. blood i.v. and at 21 hours the infant received another 15 cc. blood i.v. for a total of 80 cc. blood. Jaundice was noted later on the day of birth which gradually increased and a chest x-ray showed diffuse cardiac enlargement. The infant died at twenty-four hours of age. Autopsy disclosed erythroblastosis with the liver weighing 240 grams (normal 78 grams) and the spleen 30 grams (normal 8 grams). There was a 2x3x6 cm. right subarachnoid hematoma overlying the right frontal lobe. No mention was made of kernicterus.

A forty-three-year-old primigravida was Rh negative. The father's Rh was not done. No anti-Rh tests were done during the pregnancy. Labor was spontaneous, first stage lasting fifty-five minutes and second stage seven minutes. Presentation was LOA, no anesthesia was used. The infant weighed 7 pounds, ½ ounce, and breathed spontaneously. Jaundice developed during the first twenty-four hours of life and increased rapidly. The Coombs test was strongly positive. An exchange transfusion was not done until the day after birth. On the fourth day of life generalized twitchings developed which were interpreted as signs of kernicterus. The infant expired at four days of age. No autopsy was done. The cause of death was listed as erythroblastosis.

3. *Four Pediatric Preventable Deaths.*

A twenty-year-old primipara had a normal pregnancy and spontaneous onset of labor, first stage twenty-three hours, second stage one hour. Presentation was ROP and low forceps were used. Anesthesia was nitrous oxide and oxygen. The infant weighed 7 pounds, 14 ounces. Feedings were started at twenty-four hours of age, and the infant nursed well along with supplemental feedings until the fourth day when it appeared dusky after nursing and the respirations became rapid and shallow. Oxygen was given and a chest x-ray was taken (no information available as to x-ray report). The infant took two subsequent feedings at four hour intervals, but the respirations became quite labored and the color dusky. Clinical impression was possible congenital cardiac anomaly. Several times the infant cried as if in pain and the color became ashen. The same evening the infant was given alpha-lobeline and cedilanid .05 cc. i.m. No cultures were taken or antibiotics given. The infant expired the next morning at four days, twelve hours of age. Autopsy disclosed severe early pneumonia with focal hemorrhages in kidney and lungs and petechial hemorrhages on serous surfaces.

A twenty-four-year-old mother (one previous 2¼ pound stillborn infant) had a normal pregnancy and spontaneous labor, first stage fifteen hours and fifty-five minutes, second stage seven minutes. Presentation was LOP and the infant was manually rotated to LOA. Anesthesia was 1 per cent novocain pudendal block fifty-five minutes before birth. The infant weighed 6 pounds, 10 ounces. He breathed and cried spontaneously. The infant did well until the third day when he began having cyanotic episodes which responded to oxygen. Rhonchi were present in the posterior lung fields. Suctioning produced thick milk containing mucus. The temperature rose to 103° (R), and the infant died at three days of age. No antibiotic therapy was given. Autopsy disclosed lobar pneumonia, subcapsular hemorrhage of the liver, septicemia (*E. coli* organisms cultured from the blood), patent ductus arteriosus, and interatrial septal defect.

A thirty-four-year-old Rh negative mother had previously had four full term infants and one abortion (first pregnancy normal, second pregnancy spina bifida, third and fourth pregnancies erythroblastosis with survival). The father's Rh was not done and no anti-Rh tests were done during pregnancy. The pregnancy was uneventful and the membranes ruptured spontaneously at forty weeks. To induce labor, pitocin was given (one minim) for six doses and five grains quinine for four doses. Five hours after the membranes ruptured, labor began, first stage two hours, second stage seventeen minutes. Anesthesia was nitrous oxide and oxygen. The infant weighed 6 pounds, 10 ounces, and cried lustily after one minute. On the day of birth the infant was found to be Rh positive, 1 nucleated RBC per 100 WBC, total Van den berg 3.4 mgm. per cent, hemoglobin 83.5 per cent. On the day following birth the infant was jaundiced and had slight spastic movements, the hemoglobin was 15.5 grams in the morning but fell to 11.9 grams by afternoon. The infant received 60 cc. of blood i.v. on the day after birth. On the third day the hemoglobin was 16.8 grams, fourth day 15.5 grams in the morning and 13 grams by afternoon. Profuse orange mucus was suctioned on the fourth day. The infant received no more blood, and expired on the fourth day. No autopsy was done. Cause of death was listed as erythroblastosis.

A twenty-four-year-old primipara was Rh negative. The father's Rh was not recorded. Anti-Rh titre was negative six weeks prior to delivery but was 1:2000 three weeks following delivery. (The mother had received an anti-Rh stimulus several years prior to pregnancy). On the way to the hospital, the mother was involved in an automobile accident, she appeared excited but no injury was found. First stage of labor lasted sixteen and one-half hours, second stage one-half hour. Anesthesia was 1 per cent procaine pudendal block along with trilene with contractions. The infant weighed 3318 grams, breathed spontaneously, did well and was put to breast and nursed fairly well. On the third day it was noted that the infant was jaundiced, Coombs test was negative and the hemoglobin 17 grams (no previous laboratory work). No bilirubin determination was done at any time. On the fourth day the infant's color was dusky and he made grunting noises. No antibiotics were given. The infant expired on the fourth day. Autopsy disclosed kernicterus, bilateral pneumonitis (amniotic fluid aspiration), omphalitis, multiple microscopic abcesses of the pyramids of the kidneys, and suppurative adenitis of a subaxillary lymph node.

Summary and Conclusions

1. The Hennepin County Neonatal Mortality Committee presents a study of the 379 neonatal deaths which occurred in the 20,261 live births in Hennepin County during 1953. The study reveals a neonatal death rate of 18.7 per 1000 live births. Comparative tables for 1952 and 1953 are included with greater amplification by specific birth weights in the latter study.

2. Percentages of deaths in premature and full term infants are similar for both years: in 1952, 70.8 per cent premature and 28.5 per cent full term; in 1953, 71.2 per cent premature and 28.8 per cent full term. Prematurity, thus, is shown to be a major problem in neonatal mortality and is of particular concern to physicians providing obstetric care.

3. Autopsies were obtained in nine out of ten of the neonatal deaths which occurred in 1953, compared to about eight out of ten of those occurring in 1952. However, in 1952, of prematures below 1000 grams 47.3 per cent had autopsies, while in 1953 only 33.6 per cent did so. Since significant anatomic abnormalities may be found even in the so-called previable group, it is important to obtain adequate necropsies not only on larger infants but also on babies under 1000 grams.

4. The distribution of deaths by the age of the mother represent the distribution of total births.

5. Serologic tests for syphilis were done in 72.5 per cent of the pregnancies.

6. Obstetric complications were reported in 37 per cent of the pregnancies in 1953, in 34 per cent of those in 1952; in two-thirds, however, there were no known obstetric abnormalities. Such complications were more common in premature deliveries and were mostly abruptio placentae, placenta previa, undiagnosed types of antenatal bleeding and toxemia. It should be possible in most cases of antenatal bleeding to make a definite diagnosis.

7. 65 per cent of the neonatal deaths were cephalic deliveries, 24 per cent were breech, and 8.4 per cent were cesarean sections. Breech deliveries are most frequent with the smaller prematures where particular care in delivery is necessary.

8. Of the thirty-two sections (8.4 per cent of deliveries), twenty-two were emergency sections because of placenta previa or abruptio resulting in immature infants. Six neonatal deaths were associated with elective section, all of which were immature. Since many elective section babies who are premature do not do well, avoidance of error in judgment in timing is important.

9. The Rh factor was determined in only 70 per cent of the mothers in the study, but should be done in all pregnancies. No ABO incompatibilities were reported. Of the Rh tests made in 1953, 82 per cent of the mothers were Rh positive and 18 per cent were negative: in the 1952 study 23 per cent were Rh negative.

10. Of all neonatal deaths studied, 12 per cent occurred during the first hour of life; almost 60 per cent within the first twenty-four hours; almost 80 per cent within the first forty-eight hours; 15 per cent between two and seven days; and only 5 per cent between eight and twenty-eight days of life. However, if only neonatal deaths of full term infants are considered, only 65 per cent of these died during the first forty-eight hours, 22 per cent between two and seven days and 11 per cent between eight and twenty-eight days of life.

(Continued on Page 598)

Case Presentation

Abscess of the Tongue

VERNON A. VIX, M.D.
Worthington, Minnesota

OUR recent encounter of an abscess of the tongue in an otherwise normal individual was a new experience to us, and a brief review of some standard text books of surgery, internal medicine and otolaryngology disclosed that this condition is either not mentioned or mentioned very briefly. Once seen, or if one is aware of the entity, it should be readily recognized and appropriately treated. It is because this condition is not frequently encountered that this single case is being reported.

Case Report

The patient was a thirty-six-year-old farmer who was in good health until the night of November 16, 1955, at which time he noted the onset of a small lump in his tongue which was somewhat tender. During the night this increased in size. When seen the following morning (November 17, 1955) the patient had no complaints except those referable to his tongue. Physical examination disclosed a temperature of 98.4°. Findings were limited to the tongue. There was a small walnut sized mass in the middle third of the tongue to the left of the mid line which produced visible bulging both superiorly and inferiorly. This mass was firm and moderately tender. There was good oral hygiene. No external lesions were visible on the tongue or floor of the mouth. There was a small slightly tender lymph node at the angle of the left mandible. The peripheral blood disclosed a white blood count of 11,600, neutrophils 77 per cent, lymphocytes 17 per cent, eosinophils 3 per cent, monocytes 3 per cent. Because the lesion was felt to be inflammatory in origin, the patient was given 800,000 units of procaine penicillin and advised to apply frequent cold liquids to the tongue to limit swelling. He was instructed to return the following day or sooner if evidence of progression occurred.

About 6:00 p.m. the same day (November 17, 1955) the patient returned because of increasing pain, which radiated to his left ear, and swelling of the tongue. These symptoms were accompanied by generalized aches, malaise and chills. Past history was noncontributory. The patient had had recurrent chills and fever after discharge from the service in 1945. He had been stationed in the South Pacific. These episodes were controlled by quinine without a specific diagnosis being made. There was no recent or past evidence of fungus infection in his livestock.

The patient was admitted to the hospital at which time examination disclosed a temperature of 101.2°. The patient appeared flushed and mildly toxic. Speech was impaired because of increased swelling of the tongue. The swelling had become more diffuse and extended now across the mid line. There was an indurated tender area in the middle third of the tongue to the left of the mid line. The lymph node at the angle of the left mandible had increased in size and had become more tender.

Because of the increase of symptoms and the evidence of an infectious process, incision and drainage of the tongue was thought indicated. The impression at this time was either an infected cyst or an abscess of the tongue.

After infiltration with procaine, a stay suture was placed through the tip of the tongue to be used as a retractor.* The left lateral inferior portion of the tongue was infiltrated with procaine and the mucosa was incised in this area. The tongue was probed with a small forceps until a pocket which drained several cubic centimeters of pus was encountered. A small rubber drain was sutured in place. Following this procedure penicillin was continued. The temperature had decreased to 99.4° by the following morning and the patient appeared much improved. Because of a later slight temperature rise, the incision was probed but no further pus was encountered. After thirty-six hours the patient's temperature became normal and remained so. Two days after drainage was carried out the patient was discharged from the hospital. Healing was subsequently rapid, uneventful and complete.

Cultures of the pus found at surgery showed alpha hemolytic streptococci. Further identification of this organism was not carried out. There was no growth of fungi on thioglycollate broth after one month.

Discussion

The most comprehensive report on this condition found in a brief review of the literature was a report from the Netherlands.[1] Huizinga reported forty patients seen in a period of about nineteen years. The symptoms recorded were similar to the above patient. It is interesting to note that thirty-nine of the forty patients were males and

---

From the Worthington Clinic, Worthington, Minnesota.

*Surgery by Dr. L. D. Dawson.

thirty of the group were agriculture workers or farmers. No specific etiology could be implicated. Huizinga recommended that the tongue be explored with a large needle and should an abscess be encountered an incision should be made using the needle as a guide. It is recommended that incision be made as nearly as possible to the mid line to avoid encountering the lingual artery or hypoglossal nerve. Technically working from the inferior surface of the tongue is easier because of the usual marked swelling of the tongue. Even though many of the patients seen by Huizinga were seen before the availability of antibiotics, there was no mortality and no case progressed to edema necessitating tracheotomy. In some instances, all of which were located deep in the base of the tongue, spontaneous rupture occurred. It would seem that if this condition is recognized and incision carried out early, one should anticipate rapid improvement and few complications.

Summary

A case of abscess of the tongue is reported. Therapy should primarily consist of early incision and drainage.

Reference

1. Huizinga, Eelco: Year Book of Eye, Ear, Nose and Throat. Edited by Samuel J. Crowe and Louis Bothman. Chicago: Year Book Publishers, 1948.

X-RAY PELVIMETRY

(Continued from Page 585)

the stereoscopic parallax method of Hodges, was made in a series of forty-nine cases. The variations obtained are presented and compared with those reported by others as resulting from variations inherent in the process of measuring and interpreting pelvimetry films itself. It is concluded that the variability in results obtained by the two methods under discussion is of the same order of magnitude as one might expect with repeated measurement of any pelvimetry film by one individual.

Conclusion

X-ray pelvimetry by the Colcher-Sussman technique is simple, easily understood and applied, inexpensive and acceptable in accuracy. Its use is recommended.

Acknowledgment

The author wishes to acknowledge the assistance of Eugene Johnson, Instructor, Division of Bio-statistics of the School of Public Health of the University of Minnesota, in the statistical analysis of the results of this study.

References

1. Colcher, A. E., and Sussman, Walter: Changing concepts of x-ray pelvimetry. Am. J. Obst. & Gynec., 57:510-517, 1949.
2. Lilienfeld, A. M.; Treptow, E., and Dixon, D. M.: A study of variations in the interpretation of x-ray pelvimetry. Human Biol., 21:143-162, 1949.

HENNEPIN COUNTY NEONATAL MORTALITY STUDY

(Continued from Page 596)

11. Chief causes of death in all neonatal deaths were as follows: immaturity unqualified 30 per cent, atelectasis 21 per cent, congenital anomalies 16 per cent, infection 7 per cent, birth trauma 6 per cent and erythroblastosis 5 per cent. For full term infants only, the chief causes were congenital anomalies 37 per cent, atelectasis 14 per cent, erythroblastosis 13 per cent, infection 13 per cent, trauma 10 per cent.

12. The seventeen obstetric, two obstetric-pediatric, and nine pediatric preventable deaths in the 1953 study are discussed in detail.

13. The collaboration of all specialties is essential in a study of neonatal deaths if all pertinent data of the mother in her pregnancy and labor and of the resulting offspring are to be recorded and critically reviewed. Any inadequacies of facilities or care or errors of omission or commission must be brought to the attention of the practicing physician if continued reduction in infant mortality is to be accomplished.

References

1. Hennepin County Neonatal Mortality Study. Journal-Lancet, 74:253-259, 1954.
2. Potter, Edith L.: Pathology of the Fetus and the Newborn. p. 55. Chicago: Year Book Publishers, 1952.

Seminar

REACTIONS TO PENICILLIN

I. Review of the Literature Concerning Severe Reactions (English and North American)

DONALD J. CORR, M.D.
WILLIAM E. WELLMAN, M.D.
Rochester, Minnesota

SINCE most physicians today use penicillin in some form, the increasing number of reports of shock and death following its administration prompted us to investigate its relative dangers. Our particular purpose has been to ascertain whether certain preparations and certain routes of administration are more likly to cause severe reactions. We also were interested to discover the incidence of all types of reactions to penicillin at the Mayo Clinic.

Although excellent reviews concerning severe reactions to penicillin are available,[1-4] we found none that summarized the data we sought. Therefore, publication of a compilation of this information appeared justified. As our review of this literature from the English-speaking countries became so voluminous, it became necessary to divide our study into three parts.

This, the first part, deals only with a review of the literature, whereas the second part will deal with the incidence of reactions to procaine penicillin G in aqueous suspension during 1952 and 1953 ~~as compared to the incidence of reactions to procaine penicillin G in aqueous suspension during 1952 and 1953~~ as compared to the incidence of reactions to a sesame-oil preparation reported in 1948, and the third part will consider the over-all incidence of reactions to penicillin at the clinic in 1952.

We have reviewed the literature from 1943 through June, 1954, emphasizing severe reactions to penicillin with the aim of summarizing the available useful information with regard to the occurrence, prevention and treatment of such reactions. Excluded from this review are the milder cutaneous reactions, adverse sequelae from intrathecal administration of penicillin and the Jarisch-Herxheimer reaction that has been described following penicillin therapy for syphilis. Table I lists the number of severe reactions reported in each of the years in question.

The following review is divided into years to facilitate easy reference.

TABLE I. CHRONOLOGY OF 250 SEVERE REACTIONS TO PENICILLIN

Year Reported	Outcome	
	Fatal	Non-Fatal
1943	0	0
1944	0	0
1945	0	3
1946	2	0
1947	1	1
1948	2	1
1949	1	0
1950	1	4
1951	4	31
1952	6	6
1953	46	110
1954 (through June)	11	20
Total	74	176

1943

In March, 1943, the Floreys[5] reported on the first 172 patients treated with penicillin; they observed no toxic symptoms attributable to the drug. The first reactions after administration of penicillin were described in the reports of Keefer and associates[6] and Lyons,[7] which appeared late in 1943. None of the reactions observed were considered serious. Lyons was the first to mention the sudden unpleasant taste in the mouth that subsequently has been reported often in conjunction with the more severe reactions to penicillin.

1944

Severe reactions also were not reported in 1944. However, Welch and Rostenberg[8] observed positive results of skin tests with therapeutic forms of penicillin among patients who never had received the drug. Feinberg[9] noted that patients who displayed cutaneous sensitivity to the molds from which penicillin was derived were not necessarily allergic to penicillin itself.

Dr. Corr is a Fellow in Medicine, Mayo Foundation, and Dr. Wellman is in the Section of Medicine, Mayo Clinic and Mayo Foundation, Rochester, Minnesota.

The Mayo Foundation, Rochester, Minnesota, is a part of the Graduate School of the University of Minnesota.

1945

The first case of anaphylactoid shock following penicillin therapy was reported by Cormia and associates.[10] This patient, twenty minutes after receiving an intramuscular injection of penicillin, became unconscious for fifteen minutes. Another patient, who continued to receive penicillin topically despite a mild urticarial reaction, became semiconscious within twenty-four hours; pulmonary edema developed before he recovered. Both these patients had received penicillin previously. Price and co-workers[11] described severe asthma developing late in the course of penicillin therapy.

1946

Wilensky[12] reported on the first patient whose death was attributed to penicillin, a middle-aged man in whom subtotal gastrectomy was performed. Penicillin in a dose of 30,000 units given intramuscularly every four hours was used as a prophylactic measure postoperatively. After five days of therapy, fever and a scarlatiniform rash appeared and the patient died on the seventh day after operation. Spain and Clark[13] described a patient whose leukocyte count decreased to 100 cells per cubic millimeter of blood on the third day of a cutaneous reaction that was attributed to penicillin. Administration of penicillin was stopped and the leukocyte count increased to 10,700 just before death. However, this patient also received 6 gm of a sulfonamide drug. O'Donovan and Klorfajn[14] noted mild shock after intramuscular administration of 15,000 units of penicillin to a patient who had received penicillin topically During later desensitization, a dose of 100 units of penicillin given subcutaneously produced mild shock. However, 15,000 units of penicillin was taken orally thirteen days later without evidence of reaction.

1947

Anderson[15] reported the occurrence of intestinal purpura, arthralgia and toxic nephritis in a patient two days after completion of a nine-day course of penicillin. This patient had received penicillin previously, and there was a family history of asthma. Templeton, cited by Florey,[16] reported a death owing to penicillin therapy.

1948

Brown,[17] in a detailed and excellent review of the side effects of penicillin recorded from 1943 to 1948, observed that anaphylactoid responses were not reported when use of penicillin was continued in the presence of reactions to it. Anderson and Keefer[18] summarized their experiences with penicillin in 10,420 patients and found the incidence of reactions (exclusive of local forms) to be 6 per cent; this included 1.6 per cent who had urticaria, 0.85 per cent who had fever and 0.02 per cent who had asthmatic symptoms owing to use of penicillin. Sawicky and Rein[19] reported anaphylactoid shock after the intramuscular administration of 300,000 units of penicillin in oil and wax to a patient who previously had experienced a generalized cutaneous eruption after topical application of penicillin. Barksdale and co-workers[20] reported exfoliative dermatitis and death after penicillin was given intramuscularly to a patient with a history of a previous reaction to penicillin. Berk and Sostek[21] described a patient who had an eosinophilia of 21 per cent after administration of penicillin without any other evidence of reaction; the eosinophilia was reproducible. Rabinovitch and Snitkoff[22] reported on a patient who died fifteen days after the onset of exfoliative dermatitis that was attributed to penicillin.

1949

Waldbott[23] reported the first instance of sudden death owing to penicillin—an asthmatic patient in whom shock developed five seconds after 50,000 units of penicillin was given intramuscularly. Falk and Newcomer[24] reported that Löffler's syndrome occurred in patients treated with penicillin in oil and wax. A careful study by Lepper and associates[25] showed that the incidence of reactions to crystalline penicillin increased with larger doses. They found reaction rates of 1.2 per cent after injection of aqueous crystalline penicillin G, 2.7 per cent after use of penicillin in oil and beeswax, and 1.4 per cent after administration of procaine penicillin G in oil. Immediate shock reactions did not occur in their series of 1,303 cases. According to their review of the literature, 18 per cent of patients who reacted to penicillin gave histories of allergy and 80 per cent had received penicillin previously.

1950

Burleson[26] reported anaphylactoid shock occurring in a penicillin-sensitive patient fifteen minutes after the intramuscular administration of 200,000 units of procaine penicillin. Berne[27] described a patient who died as the result of exfoliative dermatitis after intramuscular administration of penicillin in oil and wax. This patient was sensitive to penicillin and also received a sulfonamide with the penicillin. The Felders[28] described a reaction manifested by urticaria, myocarditis and hepatitis that developed fourteen days after the patient received penicillin in sesame oil four times daily for ten days. Leibowitz and Schwartz[29] reported a case of anaphylactoid shock after aerosol treatment of an asthmatic patient and mentioned another similar case. Zussman[30] questioned the value of antihistaminic therapy for reactions resembling severe serum sickness, and cited Dreisbach's[31] observation of the failure of diphenhydramine hydrochloride (Benadryl®) and tripelennamine hydrochloride (Pyribenzamine®) to prevent experimental cutaneous sensitization to penicillin and horse serum.

1951

Siegal[32] concluded that administration of penicillin need not be discontinued when patients exhibit mild or moderate reactions, and that penicillin is tolerated by the great majority of patients who give histories of a single previous allergic reaction to penicillin. He distinguished between permanent and transient sensitization and cited Risman and Boger[33] to the effect that two-thirds of patients sensitive to penicillin G also are sensitive to penicillin O as indicated by results of skin tests. Anderson[34] reported on three patients who required tracheotomy for laryngeal edema one to six days after penicillin therapy; one patient received penicillin orally and the other two received it intramuscularly. Panja and Banerjee[35] described fatal exfoliative dermatitis in a thirty-three-year-old woman who was sensitive to both penicillin and streptomycin and who also gave a history of asthma.

Gold[36] speculated on the role of penicillin in the pathogenesis of systemic lupus erythematosus and observed that three of his eight patients with this disease were made worse by penicillin. Mirabel[37] described a sixty-year-old man in whom nonthrombocytopenic purpura of the Henoch-Schönlein type, acute nephritis and angioneurotic edema developed after his first injection of penicillin. The purpuric manifastations lasted six months. Humphreys[38] reported immediate convulsions in a patient who received 300,000 units of procaine penicillin intramuscularly. Criep and Cohen[39] reported four cases of nonthrombocytopenic purpura attributable to penicillin. Corajod and associates[40] reported a case of anaphylactoid shock and death due to penicillin. Epstein[41] reported chronic urticaria lasting three to fifteen months after penicillin therapy; four of the six patients affected received procaine penicillin and two never had received penicillin previously. Several patients threatened to commit suicide because of the urticaria. A correspondent to the *British Medical Journal*[42] mentioned a fourteen-month-old girl who received penicillin intramuscularly after a mild burn and died five days later; necropsy revealed pericardial effusion and tamponade.

Batchelor and co-workers[43] described eight alarming reactions to procaine penicillin in aqueous suspension in a series of 398 patients treated for syphilis. Immediately after intramuscular injection, all eight became weak and several expressed a fear of impending death; shock did not develop. Six of the eight had unusual fatigue for the following week. Five received subsequent injections without reaction. Everett[44] reported two and mentioned four more cases of shock following use of 300,000 units of procaine penicillin G in peanut oil given after antral lavage with a solution of penicillin. Irwin and associates[45] described non-fatal anaphylactoid shock after 300,000 units of procaine penicillin G was administered to a patient who previously had demonstrated sensitivity to penicillin. Lapin and Mond[46] reported on two children, aged four and five years, respectively, in whom an "encephalitic syndrome with myocarditis and nephritis" developed after oral use of penicillin. These authors cited Hansel to the effect that sensitivity to penicillin may disappear or gradually decrease over a period of six months to a year, or may increase with each subsequent attack. Adelson[47] reported on a four-month-old child in whom the first oral course of penicillin caused urticaria and death in twenty-two days due to periarteritis nodosa. Spring[48] described a fifty-three-year-old man in whom nonthrombocytopenic purpura and nephritis developed twenty-four hours after he received 300,000 units of procaine penicillin intramuscularly; the purpura lasted for six weeks.

1952

Three patients who experienced anaphylactoid shock after administration of penicillin were reported on by Yuval,[49] Yoder and Lyaander[50] and

Stroud.[51] These reports were included in Florey's[5] excellent review of reactions to penicillin. Wilson[52] reported on a thirty-seven-year-old man who had received penicillin uneventfully three years previously and who experienced edema and tightness in the thorax fifteen minutes after intramuscular injection of aqueous procaine penicillin G. Harkavy[53] reported death of two patients in whom purpura and arterial changes were attributed to penicillin: necropsy in one case showed arteritis and acute hepatic necrosis. Waugh[54] described necropsy findings of myocarditis, arteritis and focal hepatic, splenic and renal granulomas in a sixty-year-old-man who had a cutaneous eruption attributed to penicillin. However, this patient also received a sulfonamide and streptomycin during the course of treatment.

Thomson[55] described sudden shock and death after intramuscular administration of 300,000 units of crystalline penicillin G in a sixty-seven-year-old patient who had recovered one month previously from an immediate anaphylactoid shock after receiving an intramuscular injection of procaine penicillin G. Harpman[56] reported on a three-year-old child who became unconscious within one hour and died within three and one-half hours after receiving an intramuscular injection of procaine penicillin. This child had received penicillin previously without reaction, and there was no history of allergy. Necropsy revealed changes consistent with an anaphylactoid reaction. This author also described immediate nonfatal shock and convulsions occurring in a patient during intramuscular injection of procaine penicillin.

Higgins and Rothchild[57] reported anaphylactoid shock and death ten minutes after an injection of 300,000 units of procaine penicillin G given routinely after an operation. The patient had no history of allergy and had received penicillin previously without evidence of sensitivity.

1953

Walsh and Zimmerman[58] demonstrated the L. E. phenomenon in three of six patients in whom sensitivity to penicillin developed. Reichlin and co-workers[59] reported Löffler's syndrome after intramuscular administration of penicillin. Siegal and associates[60] reported death in an asthmatic patient almost immediately after the intramuscular injection of 300,000 units of aqueous procaine penicillin; this patient had received penicillin previously without reaction. Immediate severe nonfatal anaphylactoid reactions in two patients also were mentioned; one of these patients had received aqueous procaine penicillin intramuscularly. Mayer and co-workers[61] reported sudden death after 300,000 units of aqueous procaine penicillin was given intramuscularly to a patient who previously had fainted after taking a penicillin troche for an infection of the upper part of the respiratory tract. Five other patients, who had almost immediate anaphylactoid shock with recovery, also were described. All six of these patients had received penicillin on previous occasions, and four had experienced reactions. Passive-transfer tests demonstrated circulating antibodies for penicillin in four of the five patients so studied. None reacted to procaine. One patient later received 10 units of penicillin intradermally and collapsed; blood pressure was not obtainable for fifteen minutes. This patient experienced the same strange taste in his mouth that had occurred during his previous reactions to penicillin.

Christenson and associates[62] reported an immediate fatal reaction after 300,000 units of procaine penicillin was given intramuscularly. This patient had no allergic history but had used an ophthalmic ointment containing penicillin eighteen months previously. Chapman and Metheny[63] described a sixty-three-year-old patient who became unconscious within five minutes after he received 300,000 units of aqueous procaine penicillin before an operation. He recovered in ninety minutes, after which it was learned he had experienced a reaction to penicillin more than a year previously. Nikishin[64] reported shock five minutes after an intramuscular injection of 300,000 units of procaine penicillin G. The patient's treatment included use of norepinephrine, and recovery occurred in twelve hours; an allergic history was absent but the patient had received penicillin previously without reaction. Curphey[65] reported sudden death in two asthmatic patients: death occurred in one after 300,000 units of aqueous procaine penicillin was given intramuscularly, whereas the other patient received 400,000 units of crystalline penicillin with 0.5 gm. of streptomycin. One patient had received penicillin four years previously without reaction and the other was known to be allergic to penicillin in oil.

Geraci and Manning[66] reported the use of penicillin 0 in the treatment of subacute bacterial endocarditis in three patients who were sensitive to penicillin G. Although mild reactions developed in these patients, the treatment was successful. Feinberg and associates[2] reported on four patients who died almost immediately and two who experienced nonfatal anaphylactoid shock as the result of penicillin. The condition in another patient described by this group appeared identical to that of the one reported by Christenson and co-workers. In addition, they reported a death following immediately after inhalation of penicillin powder. Two patients were known to have had previous reactions to penicillin and one had asthma. One received procaine penicillin in peanut oil and one received crystalline penicillin G intramuscularly. One of the patients, a soldier with a wound of the elbow, died four hours after the intravenous administration of penicillin. This occurred in February, 1944, and is the only reported fatality attributable to the intravenous use of penicillin. It is of interest that morphine was administered while the patient was in shock and that thrombosis of the axillary vein was found at necropsy.

Within a period of five weeks in his practice, Larsen[67] observed two patients who experienced anaphylactoid shock from penicillin. Both had received penicillin previously without reaction. One patient was given 600,000 units of procaine penicillin G and the other received 400,000 units of penicillin with 0.5 gm. of streptomycin. Subsequent skin tests revealed positive reactions to penicillin but no reactions to procaine. Mignault and Mitchell[68] reported anaphylactoid shock within five minutes after an intramuscular injection of procaine penicillin, with recovery after unconsciousness for twelve hours. Results of subsequent skin tests with procaine and crystalline penicillin were negative but cutaneous sensitivity to procaine penicillin was noted. Whipple[69] recorded acute anaphylactoid shock after intramuscular administration of aqueous procaine penicillin G; nine days of bloody diarrhea followed this reaction. The author considered that the patient subsequently had acute ulcerative colitis and acute ulcerative cystitis as a result of the penicillin.

Collins-Williams and Vincent[70] added reports of two immediate fatal and six severe nonfatal reactions from penicillin. Neither of the patients who died was known to have asthma. Results of skin tests were positive in three of seven adults known to be sensitive to penicillin. One patient who experienced a mild immediate constitutional reaction had an absence of cutaneous sensitivity to penicillin one year later. Wofford[71] reported shock three minutes after penicillin was administered intramuscularly to a pregnant woman who had received penicillin previously without reaction.

Sohval[72] suggested that the severe immediate reactions following administration of penicillin could be divided into two categories, namely (1) anaphylactoid shock and (2) weakness-fear reaction. His case is illustrative of the latter type and is similar to those reported by Batchelor's group, in 1951. A fifty-six-year-old man had received penicillin previously, with a questionable reaction. After the third injection, given in February, 1953, he experienced vertigo, a metallic taste in the mouth, tightness in the thorax, pallor, tachycardia and angor animi. Shock did not develop and, although no treatment was given, recovery ensued in fifteen minutes.

Banerjea and Roy[73] reported three deaths owing to exfoliative dermatitis in patients receiving penicillin. One patient was given diphtheria antitoxin coincident with aqueous penicillin; enterocolitis developed before death occurred thirty-two days later. Another patient died from associated "coronary thrombosis" and the third died two months after aqueous penicillin was given. A correspondent to the *British Medical Journal*[74] reported on a forty-one-year-old woman who died one hour after 400,000 units of procaine penicillin was given intramuscularly. Icasiano[75] reported an almost fatal anaphylactoid shock reaction after use of penicillin.

Boger and co-workers,[76] in a panel discussion, emphasized the unpredictability of severe reactions to penicillin and stated that there was no evidence to implicate procaine by itself as the cause of such reactions. The same panel also mentioned a fatality after an intradermal test for sensitivity to penicillin. In the prevention of severe reactions, these authors suggested (1) avoidance of needless sensitization, (2) employment of oral preparations of penicillin for mild infections, (3) inquiry concerning history of previous reactions to penicillin, (4) use of a tourniquet above the site of injection, with a pause of forty-five seconds after the first several drops are injected, and (5) use of the scratch test, employing an aqueous solution of penicillin G containing 10,000 units per cubic centimeter, with a wait of fifteen minutes if testing for cutaneous sensitivity is to be done.

Weiss[77] described shock after the antral instillation of crystalline penicillin G in a nonallergic patient who previously had shown sensitivity following oral administration of penicillin; results of skin tests for sensitivity to penicillin were negative fourteen months later and aerosolized penicillin was tolerated without reaction.

Herrell[78] stated that the incidence of cutaneous reactions to penicillin is minimal with preparations of procaine penicillin. Alexander[79] discussed desensitization of the penicillin-sensitive patient and emphasized that not all patients who have reactions require desensitization, because the sensitivity in some is transient. To desensitize, he often started with doses of 250 units given intramuscularly four times a day; the individual doses on each succeeding day were doubled until the required dosage was reached and the program was not discontinued if minor reactions occurred.

Because of the mounting number of reported severe reactions, Welch and associates[4] surveyed the records of ninety-five hospitals with a total of 51,000 beds and found data concerning fifty-nine previously unreported acute anaphylactoid reactions to penicillin; nineteen of these reactions were fatal. The injection of procaine penicillin accounted for thirty-seven of the nonfatal and eighteen of the fatal reactions found in their study; two nonfatal severe reactions occurred after use of penicillin O, whereas one nonfatal reaction was due to penicillin G diethylaminoethyl ester (Neopenil®) and one death was attributed to oral use of benzathine penicillin G. In addition, they cited the Smith, Kline and French report of twenty anaphylactoid nonfatal reactions and five fatal reactions. It was their opinion that this preparation (Neopenil) is toxic out of proportion to its use. The same authors mentioned six additional nonfatal severe reactions to penicillin of which they were personally aware; one of these reactions was due to an oral preparation. Pick and Patterson[80] reported a death five minutes after 500,000 units of penicillin G diethylaminoethyl ester (Neopenil) was administered to an asthmatic patient who had felt faint after a similar injection the day before.

Kern and Wimberley[3] reported two immediate fatal reactions and one nonfatal reaction after intramuscular injection of penicillin. Their review of the literature gave evidence that penicillin had replaced serums as the commonest cause of anaphylactoid shock. They considered that repository forms of penicillin induce sensitivity oftener and in more severe degree than do other preparations. They were convinced of the role of penicillin as a cause of fatal vascular allergy and mentioned two cases of this type seen by them. Morgan and Cronhelm[81] reported three immediate severe reactions, in one of which shock developed, after intramuscular administration of penicillin.

Farmer[82] reported on four patients who had asthma and severe giant urticaria after injection of procaine penicillin. Two were known to be asthmatic and one was sensitive to procaine. It was his opinion that skin tests are unreliable and that a careful history is more important. He considered that desensitization by the oral method is inadequate and that antihistamines are disappointing in the prevention or management of these reactions. Pryor and Burrell[83] reported one death and two immediate nonfatal reactions with shock after intramuscular administration of procaine penicillin. Two patients had received penicillin previously without reaction and two gave a history of urticaria after ingestion of certain foods.

Sterling[84] stated that further penicillin therapy is contraindicated if any of the following symptoms occur after its use: (1) syncope or a feeling of faintness recurring for three hours after injection; (2) sensation of burning or heat throughout the body; (3) local or generalized pruritus never before present and beginning within a few hours after the injection; (4) choking sensation in the throat; and (5) severe paroxysmal pain varying in location, such as in the precordium or epigastrium. Sterling administered penicillin to three patients who fulfilled one of these criteria and produced anaphylaxis in all three. Skin tests are unreliable, in his opinion, because they give false positive as well as false negative reactions.

Beck[85] described the successful treatment by means of penicillin of subacute bacterial endocarditis in a penicillin-sensitive patient who had had two relapses after other antibiotic treatment. A mild rash developed on the eight day of therapy; however, treatment was continued for a total of thirty days.

Altounyan[86] reported a death fifteen minutes after intramuscular administration of penicillin to a patient who recently had experienced a severe reaction to morphine. Anaphylactoid shock n a patient after the injection of procaine penicilin also was mentioned.

1954

Madalin[87] reported anaphylactoid shock after a lozenge that contained penicillin was in the mouth only two minutes. Bell[88] reported sudden death attributable to intramuscular use of procaine penicillin G in a nonallergic patient who had received penicillin previously without reaction. He cited three other cases of nonfatal shock due to procaine penicillin. An editorial in the same issue of the *Lancet*[89] remarked that procaine penicillin may be likely to produce reactions because it is not merely procaine plus penicillin but s a new compound, Rostenberg and Webster[90] discussed the mechanisms of cutaneous reactions to drugs, especially those owing to antibiotics. Glotzer[91] described a forty-three-year-old man in whom a generalized eruption developed after oral use of penicillin; although he did not have cardiac symptoms, all electrocardiographic leads displayed inverted T waves that persisted for a week. Binder and associates[92] reported similar changes in three patients in 1950. Collins-Williams and Ratner[93] mentioned Blanton's case of anaphylactoid shock due to oral use of penicillin and stated that delayed reactions to penicillin are less likely to confer permanent sensitivity than are immediate reactions.

Rosenthal[94] reported eight immediate deaths from intramuscular administration of penicillin, seven of which were due to procaine penicillin. The injections in two patients were not authorized by a physician. One of the patients was eighteen months of age and had not previously received penicillin. One was known to be sensitive to penicillin.

Smith and associates[95] noted six reactions to single intramuscular injections of benzathine penicillin G in 700 patients, an incidence of 0.9 per cent. Two of these six reactions were immediate shock reactions and were reported by Grekin and O'Brien.[96] One was in a nineteen-year-old girl in whom shock developed three minutes after 600,000 units of benzathine penicillin G was given: this patient recovered within two hours and recalled the occurrence of nausea and hives after an intramuscular injection of penicillin four years previously. The other shock reaction was in a fifty-three-year-old woman who was recovering from a serum-sickness type of reaction to procaine penicillin in oil when she received 3,000,000 units of benzathine penicillin G intramuscularly. She experienced shock and was apneic; artificial respiration was required before recovery was complete in five hours.

Finke[97] reported immediate shock after intramuscular administration of penicillin in thirteen patients, five of whom had noted asthmatic symptoms previously. These thirteen comprised 3 per cent of patients who had bronchitis or asthma and who were being treated with penicillin on a long-term basis. The same author also reported a death after use of procaine penicillin in an elderly man with status asthmaticus. He further observed that the incidence of complication after penicillin therapy was not greater in asthmatic patients than it was in those without asthma. Carter and Cope[98] reported on a patient who had immediate anaphylactoid shock after the application of an ophthalmic ointment containing penicillin; this patient had experienced tightness in the thorax and wheezing immediately after receiving penicillin intramuscularly three months before.

Brodey and Nelson[1] reported the successful use of cortisone and antihistamines with penicillin in the treatment of a patient who had syphilis, who was sensitive to penicillin and who had relapsed during other treatment.

Fisher[99] reported on a twenty-eight-year-old man who experienced shock five minutes after receiving 300,000 units of aqueous penicillin intramuscularly; death occurred in forty-five minutes despite vigorous therapy. This patient had undergone spinal anesthesia produced by 150 mg. of procaine without reaction several hours earlier for an operation on a hammer toe. The penicillin was given as a routine postoperative measure. There was a history of local reactions to procaine, but he had received penicillin previously without untoward effect.

Comment

The 250 severe reactions to penicillin reported in the literature we reviewed from 1943 through June, 1954, are classified in Table II. While such reactions are relatively rare considering the monthly production of more than thirty tons of penicillin, yet one physician, as already mentioned, observed two instances of anaphylactoid shock owing to penicillin in a five-week period. We would like to emphasize that extremely few of the

TABLE II. CLASSIFICATION OF 250 SEVERE REACTIONS TO PENICILLIN

Type	Outcome		Total
	Fatal	Non-Fatal	
Acute	58	152	210
Delayed	16	24	40
Total	74	176	250

TABLE III. NATURE OF 40 SEVERE DELAYED REACTIONS TO PENICILLIN

Type of Delayed Reaction	Outcome		Total
	Fatal	Non-Fatal	
"Vascular allergy" (purpura, myocarditis, arteritis)	10	15	25
Exfoliative dermatitis	6	0	6
Asthma and pulmonary edema	0	6	6
Laryngeal edema—tracheotomy	0	3	3
Total	16	24	40

TABLE IV. ROUTE AND PREPARATION IN 250 SEVERE REACTIONS TO PENICILLIN

Route and Preparation	Outcome		Total
	Fatal	Non-Fatal	
Intramuscular			
Penicillin*	13	18	31
Procaine penicillin	5	25	30
Aqueous suspension of procaine penicillin G†	45	93	138
Neopenil (penicillin G diethylaminoethyl ester)	6	21	27
Penicillin O	—	2	2
Compenamine (1-ephenamine penicillin G)	—	1	1
Bicillin (benzathine penicillin G)	—	2	2
Oral			
Penicillin	1	5	6
Bicillin (benzathine penicillin G)	1	—	1
Aerosol	1	2	3
Antral irrigation	—	1	1
Topical	—	2	2
Lozenge	—	1	1
Intracutaneous skin test	1	1	2
Intravenous	1	2	3
Total	74	176	250

*Includes amorphous and crystalline preparations, and those in oil and beeswax.

†Exact nature of preparation used not always stated but in most instances it was the aqueous suspension.

patients who had these reactions were critically ill until they received penicillin. The authors reporting these reactions were uniformly vehement concerning the indiscriminate use of penicillin.

The acute severe reaction, generally regarded as anaphylactoid, usually occurs within thirty minutes after the administration of penicillin, irrespective of route, preparation or dose. It may be manifested first by a dryness or strange taste in the mouth, angor animi, weakness, nausea or tightness in the thorax, and it may be followed by collapse, shock or unconsciousness. Pulmonary edema, laryngeal edema, cyanosis, convulsions and death may supervene. The nonfatal reactions may be followed by weakness for many days. Most of the acute nonfatal reactions noted in Table II progressed to shock; the remainder, sometimes referred to by the afore-mentioned term "weakness-fear reactions," ceased before collapse occurred.

The duration of these acute reactions is so variable that it is difficult to assess the merits of the individual measures employed in their treatment. Some patients recover without treatment. It is obvious that the relation of the reaction to the administration of penicillin should be recognized and administration of the drug should be stopped immediately. Treatment ordinarily begins with use of epinephrine, and an antihistaminic agent is usually given intravenously. Apnea is treated by insuring a clear airway, use of artificial respiration and the administration of aminophylline and other respiratory stimulants. Oxygen, blood or blood-volume expanders are needed if shock persists. Norepinephrine, corticotropin (ACTH) and cortisone have been given with apparent benefit. Vigorous efforts are justified when the patient does not respond immediately, because in several instances recovery has ensued after unconsciousness for twelve hours.

The nature of the severe delayed reactions encountered in our perusal of the literature is noted in Table III. It is sometimes difficult to establish a causal relationship between these severe delayed reactions and penicillin for two reasons. In the first place, the so-called reaction actually may be a complication of the disease for which penicillin was given. Secondly, other drugs administered to the patient during the course of the illness also might be responsible. The onset of these delayed reactions is often apparent several days after the penicillin is first given. Reactions of this type occasionally are not recognized and the use of penicillin is continued. This difficulty can be avoided if it is kept in mind that penicillin may contribute to the persistence of fever, may cause petechiae or other purpuric manifestations, may aggravate a pre-existing dermatosis or, rarely, may cause unusual weakness, asthma or shock.

It is evident from Table IV that any preparation of penicillin or route of administration is capable of causing severe reactions. The frequency with which the various preparations are sed undoubtedly plays a part in the reported inidence of severe reactions to each of them.

Procaine penicillin G in aqueous suspension iven intramuscularly, the most frequently used preparation and route of administration, is reponsible for more than half of the severe reacions recorded in the literature thus far. While details of the precise nature of the preparation of procaine penicillin used sometimes are not mentioned in the reports, it is assumed that the majority of reactions have followed the use of he aqueous suspension. This assumption appears ustified because the adjuvants of beeswax and oil have been used only to an extremely limited extent in the United States since early in 1951, and it is clear from Table I that the majority of severe reactions have been reported since that time. As indicated previously, procaine penicillin is a chemically discrete compound; therefore, procaine by itself probably is not the cause of the reactions. Moreover, no patients of whom we are aware who experienced an immediate severe reaction and subsequently were tested for cutaneous sensitivity to procaine have shown positive reactions to this material. Furthermore, the sudden strange taste in the mouth reported to occur so often with acute severe reactions to penicillin has not been noted in association with toxicity from procaine.

Benzathine penicillin G (Bicillin®) for intramuscular use does not appear at this time to be less toxic than procaine penicillin in aqueous suspension injected intramuscularly. Furthermore, it must be remembered also that preparations of penicillin which produce adequate levels in the blood for long periods may make the treatment of a delayed reaction extremely difficult. Cross reactions between penicillin O (the so-called hypoallergenic penicillin) and penicillin G appear to be the rule rather than the exception. This may be due in part to the presence of small amounts of penicillin O in preparations of penicillin G and vice versa. Penicillin G diethylaminoethyl ester (Neopenil) for intramuscular use is toxic out of proportion to the incidence of its use and is no longer available.

It has been stated that accidental intravenous injection of a preparation designed for intramuscular use might account for the production of severe reactions. However, this does not explain the severe reactions that have followed other routes of administration of penicillin. For the same reason, the sudden taste in the mouth is not attributable to toxicity as a result of accidental intravenous injection, because these phenomena have occurred when penicillin is given topically and intracutaneously. The purposeful intravenous use of penicillin has resulted in relatively few severe reactions (one fatal and two nonfatal); furthermore, it should be noted that these episodes occurred before 1948 and the role of penicillin in their production is questionable. Thus, we have encountered only one report of a death due to intravenously given penicillin and the cause of death in this case is open to question. This is of significance, for the intravenous route of administration has been employed frequently since the introduction of penicillin, in 1943.

The oral administration of penicillin has accounted for two fatal and five nonfatal severe reactions. We consider that the dangers of oral use of penicillin have not been sufficiently emphasized for the following reasons: (1) it may sensitize patients to the subsequent intramuscularly given shock dose; (2) it is likely to be employed for minimal indications; and (3) its sensitization of the patient frequently may pass unnoticed, especially if the reaction is limited to the mucous membranes.

Although fallible, the history of sensitivity to penicillin is probably the most useful single aid in the anticipation of severe reactions, which occur most commonly in patients who have exhibited clinical sensitivity to penicillin, regardless of whether the induction of such sensitivity was recent or remote. It is important to ascertain the nature of the previous reaction and to verify, when possible, that it was due to penicillin and not to other drugs given during the same illness. The risk of severe reaction appears to be increased if the previous one was immediate, generalized or severe. Conversely, the risk may be less if the reaction was delayed, localized or mild. However, severe reactions have been reported after the first administration of penicillin (spontaneous sensitivity). Furthermore, the absence of a clinical reaction to penicillin given in the past does not preclude the possibility of a severe reaction the next time it is given (latent sensitivity). On the other hand, some patients have tolerated penicillin well even after experiencing a severe reaction (transient sensitivity).

Although the patient's age and allergic status and the results of skin tests for sensitivity to penicillin are frequently mentioned, they actually are not of much value in the prediction of severe reactions. With regard to age, death occurred in five children less than six years of age, whereas two children had nonfatal severe reactions to penicillin. The remainder of the reactions occurred in adults. Asthma, or a history of it, was found in only 24 per cent of the patients who experienced these 250 severe reactions. The skin test for sensitivity to penicillin has not given consistently practical clinical information because of false negative and false positive reactions, as already indicated. Indeed, the intracutaneous test has caused shock and death, although the scratch test is regarded as safe at this time.

Penicillin should be withheld from those patients whose prognosis would appear to be favorable without it. This is especially true of the patient who gives a history of a reaction to penicillin of any degree of severity. If, however, the prognosis would appear to be unfavorable without the administration of penicillin and if sufficient reason exists to suggest the possibility of danger from the penicillin itself, then desensitization, epinephrine in oil, antihistamines and cortisone might be tried in an effort to prevent, minimize or suppress reactions. Simultaneous administration of an antihistamine with penicillin does not prevent immediate severe reactions because there is insufficient time for the drug to exert any protective action; moreover, experimental evidence indicates that antihistamines probably do not prevent sensitization to penicillin. It has been suggested that injections of penicillin be given in a location which would allow a tourniquet to be placed above the site of administration of repository penicillin in the event of a severe reaction.

While information in the literature is meager concerning the relative risk of the continuation of penicillin therapy in the presence of a reaction, it is known that shock, death and exfoliative dermatitis occasionally may supervene. Therefore, administration of penicillin should be discontinued if a severe reaction develops. It is equally clear that the milder reactions may subside, with or without adjuvant therapy, even though use of penicillin is continued. However, in the penicillin-sensitive patient, the clinician must proceed cautiously, weighing the danger of the disease against the danger of further use of penicillin.

Summary and Conclusions

A total of 250 severe reactions to penicillin has been reported in the literature from English-speaking countries through June, 1954; seventy-four of these have been fatal.

Penicillin in any form or administered by any route apparently may produce anaphylactoid shock and death, regardless of the patient's previous experience with penicillin or the allergic status or age.

The acute anaphylactoid reaction that follows use of penicillin may occur within several seconds to thirty minutes. Recovery may be immediate and spontaneous or may follow the vigorous treatment of shock for as long as twelve hours.

Measures recommended for treatment of the acute shock reaction include use of epinephrine, maintenance of a clear airway and administration of oxygen; in addition, use of antihistaminic agents given parenterally, aminophylline, norepinephrine, cortisone, corticotropin (ACTH) and blood-volume expanders may be helpful.

Although limited in value, a history of sensitivity to penicillin is the most useful single aid in the anticipation of severe reactions to penicillin.

Penicillin should be used with great caution, if at all, for a patient who has previously experienced a severe reaction to penicillin.

The use of penicillin may cause death; therefore, it must be used judiciously and not indiscriminately.

References

1. Brodey, M., and Nelson, C. T.: Use of cortisone during penicillin treatment of secondary mucocutaneous syphilis in a hypersensitive patient. New England J. Med., 250:1069-1071 (June 24) 1954.
2. Feinberg, S. M.; Feinberg, A. R., and Moran, C. F.: Penicillin anaphylaxis, nonfatal and fatal reactions. J.A.M.A., 152:114-119 (May 9) 1953.
3. Kern, R. A., and Wimberley, N. A., Jr.: Penicillin reactions: Their nature, growing importance, recognition, management and prevention. Am. J. M. Sc., 226:357-375 (Oct.) 1953.
4. Welch, H.; Lewis, C. N.; Kerlan, I., and Putnam, L. E.: Acute anaphylactoid reactions attributable to penicillin. Antibiotics & Chemother., 3:891-895 (Sept.) 1953.
5. Florey, H. W., and Florey, M. E.: General and local administration of penicillin. Lancet, 1:387-397 (Mar. 27) 1943.
6. Keefer, C. S.; Blake, F. G.; Marshall, E. K., Jr.; Lockwood, J. S., and Wood, W. B., Jr.: Penicillin in the treatment of infections: A report of 500 cases. J.A.M.A., 122:1217-1224 (Aug. 28) 1943.
7. Lyons, Champ: Penicillin therapy of surgical infections in the U. S. Army: A report. J.A.M.A., 123:1007-1018 (Dec. 18) 1943.

8. Welch, Henry, and Rostenberg, Adolph, Jr.: Hypersensitivity of the tuberculin type of crystalline penicillin sodium. J.A.M.A., 126:10-12 (Sept. 2) 1944.
9. Feinberg, S. M.: Penicillin allergy: On the probability of allergic reactions in fungus-sensitive individuals. Preliminary experiments. J. Allergy, 15:271-273 (July) 1944.
10. Cormia, F. E.; Jacobsen, L. Y., and Smith, E. L.: Reactions to penicillin. Bull. U. S. Army M. Dept., 4:694-702 (Dec.) 1945.
11. Price, D. E.; McNairy, D. J., and White, E. L.: Severe asthma: Delayed sensitization to penicillin. J.A.M.A., 128:183 (May 19) 1945.
12. Wilensky, A. O.: Fatal delayed anaphylactic shock after penicillin. J.A.M.A., 131:1384 (Aug. 17) 1946.
13. Spain, D. M., and Clark, T. B.: A case of agranulocytosis occurring during the course of penicillin therapy. Ann. Int. Med., 25:732-733 (Oct.) 1946.
14. O'Donovan, W. J., and Klorfajn, I.: Sensitivity to penicillin: Anaphylaxis and desensitisation. Lancet, 2:444-446 (Sept. 28) 1946.
15. Anderson, A. B.: Anaphylactic purpura following intramuscular penicillin therapy. M. J. Australia, 1:305-306 (Mar. 8) 1947.
16. Florey, Mary E.: The Clinical Application of Antibiotics: Penicillin. London: Oxford University Press, 1952, pp. 20-46.
17. Brown, E. A.: Reactions to penicillin: A review of the literature, 1943-1948. Ann. Allergy, 6:723-746 (Nov.-Dec.) 1948.
18. Anderson, D. C., and Keefer, C. S.: The Therapeutic Value of Penicillin: A Study of 10,000 Cases. Ann Arbor, Michigan: J. W. Edwards, 1948, 297 pp.
19. Sawicky, H. H., and Rein, C. R.: Severe reactions to penicillin. Arch. Dermat. & Syph., 58:83-85 (July) 1948.
20. Barksdale, E. E.; Frost, D. M., and Nolan, J. J.: Reactions from penicillin with case report of one fatality. U. S. Nav. M. Bull., 48:883-886 (Nov.-Dec.) 1948.
21. Berk, M. S., and Sostek, S. B.: Asymptomatic eosinophilia following penicillin administration: Report of a case. Ann. Allergy, 6:675-679 (Nov.-Dec.) 1948.
22. Rabinovitch, Jacob, and Snitkoff, M. C.: Acute exfoliative dermatitis and death following penicillin therapy. J.A.M.A., 138:496-498 (Oct. 16) 1948.
23. Waldbott, G. L.: Anaphylactic Death From Penicillin. J.A.M.A., 139:526-527 (Feb. 19) 1949.
24. Falk, M. S., and Newcomer, V. D.: Loeffler's syndrome: Occurrence in two patients treated with penicillin in oil and wax. J.A.M.A., 141:21-22 (Sept. 3) 1949.
25. Lepper, M. H.: Dowling, H. F.; Robinson, J. A.: Stone, T. E.; Brickhouse, R. L.; Caldwell, E. R., Jr., and Whelton, R. L.: Studies on hypersensitivity to penicillin. I. Incidence of reactions in 1.303 patients. J. Clin. Invest., 28:826-831 (Sept.) 1949.
26. Burleson, R. J.: Anaphylactoid shock due to penicillin: Report of a case. J.A.M.A., 142:562-563 (Feb. 25) 1950.
27. Berne, R. M.: An unusual sensitivity reaction to penicillin: Report of a case with autopsy findings. New England J. Med., 242:814-817 (May 25) 1950.
28. Felder, S. L., and Felder, Leonard: Unusual reaction to penicillin. J.A.M.A., 143:361-362 (May) 1950.
29. Leibowitz, Harry, and Schwartz, Emanuel: An unusual allergic reaction to penicillin: A case report. Ann. Allergy, 8:668-669; 689 (Sept.-Oct.) 1950.
30. Zussman, B. M.: Severe serum-sickness type of penicillin reaction: Failure of antihistaminic therapy. Ann. Allergy, 8:751-753; 771 (Nov.-Dec.) 1950.
31. Dreisbach, R. H.: Failure of Benadryl and Pyribenzamine in experimental skin sensitization to penicillin and horse serum. J. Allergy, 18:397-401 (Nov.) 1947.
32. Siegal, Sheppard: Allergy to penicillin O and the management of penicillin sensitivity. Am. J. Med., 11:196-201 (Aug.) 1951.
33. Risman, George, and Boger, W. P.: Human skin sensitivity to penicillins G, BT, and O: Demonstration of cross-sensitization. J. Allergy, 21:425-431 (Sept.) 1950.
34. Anderson, O. E.: Laryngeal obstruction due to antibiotic therapy. Arch. Otolaryng., 54:34-37 (July) 1951.
35. Panja, D., and Banerjee, A. K.: Fatal antibiotic sensitiveness: A case report. Indian M. Gaz., 86:13-14 (Jan.) 1951.
36. Gold, Stephen: Rôle of sulphonamides and penicillin in the pathogenesis of systemic lupus erythematosus. Lancet, 1:268-272 (Feb. 3) 1951.
37. Mirabel, L.: (1) Penicillin hypersensitivity reaction with purpura of Schönlein-Henoch type, acute nephritis, and angioneurotic oedema. (2) Obesity and diabetes mellitus (precipitated by infection). Proc. Roy. Soc. Med., 44:150-151, 1951.
38. Humphreys, T. V.: Sensitivity to procaine penicillin. Brit. M. J., 1:299-300 (Feb. 10) 1951.
39. Criep, L. H., and Cohen, S. G.: Purpura as a manifestation of penicillin sensitivity. Ann. Int. Med., 34:1219-1223 (May) 1951.
40. Corajod, E.; Fournel and Chatillon: Shock anaphylactique mortel dû à la pénicilline. Acta chir. belg., 50:299-303 (May) 1951.
41. Epstein, Ervin: Chronic urticaria following penicillin therapy. California Med., 74:429-430 (June) 1951.
42. Medico-Legal Correspondent: Fatal hypersensitivity to penicillin. Brit. M. J., 1:1269 (June 2) 1951.
43. Batchelor, R. C. L.; Horne, G. O., and Rogerson, H. L.: An unusual reaction to procaine penicillin in aqueous suspension. Lancet, 2:195-198 (Aug. 4) 1951.
44. Everett, Reginald: Anaphylactic reactions from local use of penicillin: Report of two cases. J.A.M.A., 146:1314-1315 (Aug. 4) 1951.
45. Irwin, J. W.; Graham, M. J.; Jacobson, B. M., and Burrage, W. S.: Penicillin allergy. New England J. Med., 245:246-248 (Aug. 16) 1951.
46. Lapin, J. H., and Mond, Irving: Serum-sickness-like syndrome from penicillin. Am. J. Dis. Child., 82:335-340 (Sept.) 1951.
47. Adelson, Lester: Periarteritis nodosa in infancy: Report of a case following allergic reactions to penicillin. J. Pediat., 39:346-353 (Sept.) 1951.
48. Spring, Maxwell: Purpura and nephritis after administration of procaine penicillin. J.A.M.A., 147:1139-1141 (Nov. 17) 1951.
49. Yuval, A.: Reaction to procaine penicillin. Lancet, 1:163 (Jan. 19) 1952.
50. Yoder, J. G., and Lyaander, H.: Anaphylactic reaction from penicillin. J. Christian M. A., 27:97-98 (Mar.) 1952.
51. Stroud, G. M.: Anaphylaxis from penicillin: Report of a case. Arch. Dermat. & Syph., 66:491-493 (Oct.) 1952.
52. Wilson, R. K.: Anaphylactic reaction from penicillin. J. M. A. Alabama, 21:291-292 (Apr.) 1952.

53. Harkavy, Joseph: Cardiovascular allergy due to penicillin, sulfadiazine, and bacterial sensitization: Results of treatment with cortisone and ACTH. J. Allergy, 23:104-122 (Mar.) 1952.
54. Waugh, Douglas: Myocarditis, arteritis, and focal hepatic, splenic, and renal granulomas apparently due to penicillin sensitivity. Am. J. Path., 28:437-443 (May-June) 1952.
55. Thomson, W. O.: Sudden death following an injection of penicillin. Brit. M. J., 2:70-72 (July 12) 1952.
56. Harpman, J. A.: Death from penicillin. Brit. M. J., 2:392 (Aug. 16) 1952.
57. Higgins, G. A., and Rothchild, T. P. E.: Fatal anaphylactic shock from procaine penicillin. New England J. Med., 247:644-646 (Oct. 23) 1952.
58. Walsh, J. R., and Zimmerman, H. J.: The demonstration of the "L.E." phenomenon in patients with penicillin hypersensitivity. Blood, 8:65-71 (Jan.) 1953.
59. Reichlin, Seymour; Loveless, Mary H., and Kane, E. G.: Loeffler's syndrome following penicillin therapy. Ann. Int. Med., 38:113-120 (Jan.) 1953.
60. Siegal, Sheppard; Steinhardt, R. W., and Gerber, Robert: Fatal and near-fatal penicillin anaphylaxis: Three new cases with a note on prevention. J. Allergy, 24:1-10 (Jan.) 1953.
61. Mayer, P. S.; Mosko, M. M.; Schutz, P. J.; Osterman, F. A.; Steen, L. H., and Baker, L. A.: Penicillin anaphylaxis. J.A.M.A., 151:351-353 (Jan. 31) 1953.
62. Christenson, W. N.; Hedrick, G. W., and Schugmann, R. F.: Fatal anaphylactic reaction following penicillin injection. U. S. Armed Forces M. J., 4:249-251 (Feb.) 1953.
63. Chapman, Kyle, and Metheny, David: Anaphylactic shock in penicillin therapy. Northwest Med., 52:207 (Mar.) 1953.
64. Nikishin, I. F.: Anaphylactic shock following administration of penicillin. Ohio M. J., 49:305-307 (Apr.) 1953.
65. Curphey, T. J.: Fatal anaphylaxis in bronchial asthma following administration of penicillin: Report of two cases with autopsy findings. New York J. Med., 53:1107-1110 (May 1) 1953.
66. Geraci, J. E., and Manning, P. R.: Antibiotic therapy in bacterial endocarditis. III. Penicillin O and hypoallergenic penicillins in treatment of subacute bacterial endocarditis. Minnesota Med., 36:466-470 (May) 1953.
67. Larsen, E. A.: Anaphylactic shock due to penicillin. J. Iowa M. Soc., 43:217-218 (June) 1953.
68. Mignault, J., and Mitchell, H. S.: Anaphylactic shock following procaine penicillin injection. Canad. M. A. J., 68:593-595 (June) 1953.
69. Whipple, Robert, Jr.: Hypersensitivity reaction to procaine penicillin anaphylactic shock, acute ulcerative cystitis, and acute ulcerative colitis. J. Georgia M. A., 42:334-336 (July) 1953.
70. Collins-Williams, C., and Vincent, J.: Sensitivity reactions to penicillin in children. Ann. Allergy, 11:454-469 (July-Aug.) 1953.
71. Wofford, C. P.: Anaphylaxis to penicillin: Report of an unusual case. Ann. Allergy, 11:470-472 (July-Aug.) 1953.
72. Sohval, A. R.: Severe immediate constitutional reaction to penicillin. J.A.M.A., 152:1430-1431 (Aug. 8) 1953.
73. Banerjea, J. C., and Roy, H. K.: Exfoliative dermatitis following penicillin therapy: Report of 4 cases—Three being fatal. Calcutta M. J., 50:298-303 (Aug.) 1953.
74. Medico-Legal Correspondent: Fatal penicillin injection. Brit. M. J., 2:446 (Aug. 22) 1953.
75. Icasiano, C. B.: Almost fatal penicillin anaphylacticlike shock reactions: Report of a case at V. Luna General Hospital. (AFP). J. Philippine M. A., 29:472-476 (Sept.) 1953.
76. Boger, W. P.: Sherman, W. B.; Schiller, I. W.; Seigal, Sheppard; and Rose, Bram: Allergic reactions to penicillin: A panel discussion. J. Allergy, 24:383-404 (Sept.) 1953.
77. Weiss, L. R.: Anaphylactic reaction from topical penicillin: Report of a case. J. Allergy, 24:407-410 (Sept.) 1953.
78. Herrell, W. E.: Reactions of toxicity incident to antibiotic therapy and their management. Ann. Allergy, 11:555-560 (Sept.-Oct.) 1953.
79. Alexander, L. J.: Desensitization of the penicillin-sensitive patient. Arch. Dermat. & Syph., 68:323-327 (Sept.) 1953.
80. Pick, F. J., and Patterson, J. F.: Fatal anaphylactic shock due to penicillin. Brit. M. J., 2:605-606 (Sept. 12) 1953.
81. Morgan, Kathleen, and Cronhelm, H. J.: Danger of penicillin injection. Brit. M. J., 2:777-778 (Oct. 3) 1953.
82. Farmer, P. W.: Penicillin sensitivity. M. J. Australia, 2:820-822 (Nov. 28) 1953.
83. Pryor, Carol G., and Burrell, Z. L.: Anaphylactic shock following penicillin injection. South. M. J., 46:1121-1124 (Nov.) 1953.
84. Sterling, Alexander: Anaphylactic shock following penicillin therapy in bronchial asthma. J. Allergy, 24:542-546 (Nov.) 1953.
85. Beck, C. A.: Subacute bacterial endocarditis in penicillin-sensitive patient. J.A.M.A., 153:1170-1171 (Nov. 28) 1953.
86. Altounyan, E. H. R.: Fatality following penicillin injection. Brit. M. J., 2:1375 (Dec. 19) 1953.
87. Madalin, H. E.: Anaphylactoid reaction following use of a penicillin lozenge. J. Michigan M. Soc., 53:61-91 (Jan.) 1954.
88. Bell, R. C.: Sudden death following injection of procaine penicillin. Lancet, 1:13-17 (Jan. 2) 1954.
89. Hypersensitivity to penicillin: Lancet, 1:31-32 (Jan. 2) 1954.
90. Rostenberg, Adolph, Jr., and Webster, J. R.: Mechanisms of cutaneous drug reactions, especially to antibiotics. J.A.M.A., 154:221-228 (Jan. 16) 1954.
91. Glotzer, S.: Electrocardiographic changes during sensitivity reaction to penicillin. Am. Heart J., 47:300-303 (Feb.) 1954.
92. Binder, M. J.; Gunderson, H. J.; Cannon, John, and Rosove, Leon: Electrocardiographic changes associated with allergic reactions to penicillin. Am. Heart J., 40:940-944 (Dec.) 1950.
93. Collins-Williams, C., and Ratner, Bret: Pediatric allergy: A critical review. Ann. Allergy, 12:198-228 (Mar.-Apr.) 1954.
94. Rosenthal, Abraham: Eight fatal anaphylactic reactions to penicillin. New York J. Med., 54:1485-1487 (May 15) 1954.
95. Smith, C. A.; O'Brien, J. F.; Simpson, W. G.; Harb, F. W., and Shafer, J. K.: Treatment of early infectious syphilis with N,N'dibenzylethylenediamine dipenicillin G. Am. J. Syph., 38:136-142 (Mar.) 1954.
96. Grekin, R. H., and O'Brien, J. F.: Anaphylactic reactions from bicillin: Report of two cases. Am. J. Syph., 38:143-144 (Mar.) 1954.
97. Finke, Walter: Long-term antibiotic therapy in chronic bronchitis and infectious asthma: Control and prevention of bronchopulmonary disease. Antibiotics & Chemother., 4:319-329 (Mar.) 1954.
98. Carter, E. S., Jr., and Cope, C. B.: Anaphylaxis due to topical penicillin. J. Allergy, 25:270-271 (May) 1954.
99. Fisher, Seymour: Fatality following penicillin injection. Ann. Int. Med., 40:1227-1230 (June) 1954.

Continuation Studies

GLAUCOMA AND THE FAMILY DOCTOR

RICHARD C. HORNS, M.D.
Minneapolis, Minnesota

Glaucoma means potential blindness. Eye symptoms and eye problems are with us at every turn and it is impossible to be a family doctor, an internist, or a pediatrician, without frequently having to consider eye symptoms and give advice on eye problems. I ask that the family doctor keep glaucoma in mind as he does his day-to-day work of caring for his patients for, as with many conditions, to think of the disease entity is a large step in making the diagnosis.

Glaucoma is a common cause of blindness. There are 260,000 blind in this country. One out of every eight blind persons has lost his vision because of glaucoma. It is estimated that one out of every fifty persons over forty years of age has glaucoma. Most of these cases are undiagnosed. This means that there are 800,000 people in the age group over forty years of age who are losing their vision due to glaucoma. Many of these patients with undiagnosed glaucoma will consult their family doctors because of vague eye symptoms or for other eye advice. Case finding in glaucoma by the family doctor can be a tremendous help in preventing blindness. It is important that these patients be considered seriously and advised properly and not be permitted to lose valuable time by drifting into the hands of nonmedical practitioners to be treated with eye glasses and eye exercises.

Definition

Glaucoma may be defined as an increase in the intraocular pressure which the eye cannot tolerate without injury to its inner structures and impairment of its visual function. Glaucoma is not a disease entity but rather a whole complex of diseases which have as their common feature an abnormal elevation of the intraocular pressure.

Classification

I. Congenital and juvenile primary glaucomas caused by developmental anomalies.
  A. Congenital primary glaucoma.
    1. Hydrophthalmia.
    2. Glaucomas associated with aniridia, neurofibromatosis, etc.
  B. Juvenile glaucoma, developmental anomalies.
II. Secondary glaucoma. Glaucoma as a complication of some other disease or damage to the eye.
III. Primary glaucoma. Glaucoma of unknown or poorly understood mechanism.
  A. Open angle glaucoma. Filtration angle of the anterior chamber is of normal width.
  B. Narrow angle glaucoma.

When to Suspect Glaucoma

Glaucoma should be suspected when:

1. A patient has blurred or "smoky" vision.
2. Close work bothers despite frequent changes in glasses.
3. There are halos or rainbows around lights.
4. There is eye pain after movies, dim lights, or emotion.
5. There is a family history of glaucoma.

Points to Check

1. Vision—use the Snellen chart at 20 feet.
2. Pupils—usually dilated and react slowly in glaucoma.
3. Optic nerve—it is "cupped" and pale in established glaucoma.
4. Tension—measured with Schiotz tonometer. Do not rely on finger test.
5. Visual fields—use test bead and do not rely on confrontation test.

Importance of Referral

Proven and suspected cases of glaucoma should be referred to an ophthalmologist for confirmation of diagnosis and treatment. After intraocular tension is brought under control the patient must be followed throughout life to be sure that control is maintained.

Concepts of Primary Glaucoma

Aqueous humor is considered to be formed by a combination of secretion and diffusion through the blood aqueous barrier. It is formed primarily in the region of the ciliary epithelium and flows forward into the anterior chamber, and escapes from the eye at the filtration angle into Schlemm's canal and then into aqueous veins and venous channels. The aqueous is in a steady state of motion or flow. Interference with the formation of aqueous, its circulation through the eye or its exit from the eye will result in an alteration in the intraocular tension.

Practically all theories of the etiology and mechanism of primary glaucoma are concerned with a disturbance in the exit of aqueous from the eye. There are two outstanding schools of thought among these theories, the neurovascular and the mechanical, and each school has numerous and prominent supporters.

It is the neurovascular school of thought on which the old classification of primary glaucoma was based. This is the classification on which most of us were brought up, namely:

1. Acute congestive glaucoma (or acute uncompensated).
2. Chronic congestive glaucoma (or chronic uncompensated).
3. Chronic simple glaucoma (or compensated).

The leading proponent of the neurovascular school is Sir Stewart Duke-Elder, who feels that the primary disturbance in congestive glaucoma is a capillary stasis in the ciliary region with increased permeability and edema and a secondary narrowing of the filtration angle of the anterior chamber with a rise in tension. The primary disturbance is thought to be a vascular imbalance, probably neurovascular. Many believe that disturbances in the parasympathetic nervous system, the sympathetic nervous system and the central nervous system may be factors in glaucoma. Others believe in hormonal factors.

The mechanical theory of the origin of primary glaucoma had its inception in 1923 when Raeder suggested a classification of glaucoma based on the depth of the anterior chamber. Barkan presented a classification of glaucoma in 1938 based on the state of the angle of the anterior chamber as observed with gonioscopic lens. With advance in gonioscopic technique it has become more apparent that cases of primary glaucoma fall into two separable groups, those with narrow anterior chamber angles and those with anterior chamber angles of normal depth. Supporters of the mechanical theory of primary glaucoma feel that the iris root blocks the filtration angle before the elevation of intraocular tension occurs and brings about the subsequent elevation of tension. The narrow angle state of these eyes is thought to be the primary predisposing factor. With attacks of increased pressure, and filtration angle closure, peripheral anterior synechia form and the filtration angle blockage gradually becomes permanent. The accumulated evidence of many investigators through anatomic and gonioscopic studies in support of the mechanical theory led the symposium panel on primary glaucoma at the 1948 meeting of the American Academy of Ophthalmology and Otolaryngology, in which Vail, Friedenwald, Kronfeld, Scheie, Dunnington, and Chandler participated, to adopt unanimously the classification of primary glaucoma into narrow angle and wide angle types, as proposed by Raeder in 1923.

Methods of Examination

Methods of examination include: tonometry, perimetry, ophthalmoscopy, gonioscopy, and tonography.

Treatment

Medical Treatment:—(1) Pilocarpine, (2) Eserine (physostigmine), (3) Carcholine (carbaminoylcholine), (4) DFP (diisopropyl fluorophosphate), and (5) Diamox (acetazoleamide).

Surgical Treatment:—(1) Iridectomy, (2) Corneoscleral trephine, (3) Iridencleisis, (4) Goniotomy, and (5) Cyclodiathermy.

General Considerations

The importance of early diagnosis of glaucoma is recognized by all, because effective treatment depends almost entirely upon the early recognition of the condition. Each year as medical science stretches man's life span, glaucoma becomes a more serious problem because it usually strikes the older age groups and is thus finding more victims. The early symptoms of chronic glau-

(Continued on Page 616)

Pulmonary Page

NEW PROBLEMS IN THE TUBERCULOSIS FIELD

M. M. WILLIAMS, M.D.
L. A. OLSON, M.D.
Ah-gwah-ching, Minnesota

As the "new" drugs and excision therapy have shortened the time needed to arrest tuberculosis, a few voices have been raised to warn the medical profession against trusting the drugs too far. Always a treacherous disease, tuberculosis is slow in making a person ill and slow in permitting a cure.

Most of the effect of the three or four more acceptable antituberculous drugs is bacteriostatic. While the drugs keep the tubercle bacilli from growing, the body must be given time to complete the healing processes.

With this bacteriostatic effect on the bacillus has come a peculiar side effect of tranquilization on the public health conscience. Patients with active, infectious tuberculosis have been allowed to receive the drugs at home. They promise to stay away from the public, forgetting that the family, hired-help, doctor's office, and grocery store are part of the public. Patients with active tuberculosis are occasionally permitted to continue working "because they turn negative in a few weeks." Some of these are known to be working with children.

Fortunately, many become bacteriologically negative in a few weeks. Some remain positive and others are not checked adequately. One or two negative smears are not enough to ascertain whether a patient's sputum is really negative. Studies conducted in New York, Chicago and the Scandinavian countries reveal that the sputum of only 50 per cent of their patients treated at home became bacteriologically negative, whereas the sputum of 75 to 85 per cent became negative when home care was preceded by adequate sanatorium care.

There has always been a tendency to terminate treatment of tuberculosis too soon and to neglect adequate follow-up. The patient feels well; the x-ray has shown no change for a few months; some cultures have been negative. If antibiotics also have been given, it is easy to believe, hopefully, that the patient will be all right. But some of these patients have had a relapse of their disease, and need to be followed closely for early signs of recurrence.

Patients must take enough of the drugs to be effectual without causing harm. Two or three must be given concomitantly to prevent development of resistance until the body has gained control of the disease. They must be given long enough to ensure an arrested case.

Patients tire of "swallowing so many pills" or forget to take them. Because of unpleasant side effects, they may persuade their doctors to discontinue one or more of the drugs. Sometimes there are dangerous allergic effects which demand stopping the drugs. On the other hand, the patient usually needs to be encouraged to put up with some unpleasantness and to finish his course of therapy. Such encouragement is best provided in the sanatorium, especially during the early months.

Poorly defined apical lesions need further study by planigrams. An unchanging x-ray does not mean the patient is not giving off tubercle bacilli. Small nodules and lesions roentgenographically stationary can produce positive gastric cultures. Contact with patients having only intermittently positive cultures of gastric washings has been known to infect children who later develop positive tuberculin tests. Repeated x-ray examination only on patients with suspicious shadows, or as a check-up for ex-patients, is not an adequate follow-up without repeated series of gastric cultures to determine whether the disease is transmissible.

Many patients classified as having inactive disease, because the x-ray lesion appears stable or fibrotic, have neglected further observation and

(Continued on Page 631)

From the Minnesota State Sanatorium, Ah-gwah-ching, Minnesota.

Clinical Notes

CARE OF THE TERMINAL CANCER PATIENT

FREDERICK M. OWENS, JR., M.D.
Saint Paul, Minnesota

THE GENERAL and specific care of the terminal cancer patient as a rule is not given thorough consideration, for most physicians have to deal with the problem very infrequently. The skill of the physician is taxed to its limit in treating such cases. To be able to carry the patient along, keep him reasonably comfortable and content throughout his period of deterioration until death, is an accomplishment attained by relatively few physicians.

The relationship and understanding obtained between the physician and the patient is the basis upon which all treatment is built. The keystone in this is *truth!* It is impossible to carry the cancer patient through the trials and tribulations of his disease without his having knowledge and some understanding of the nature of the disease. As progression occurs and new symptoms develop the patient wants to know what is causing these symptoms. If the nature of the disease is hidden from the patient, he is told "white lies." Soon these become confused as the doctor or the family forgets what the deceit is supposed to be. Slips occur, looks are furtive, not forthright, and the patient becomes suspicious. Soon he will trust neither his family nor his doctor. He is then completely alone trying to keep the family and the doctor from realizing that he knows the truth. A typical example is that of a woman who had cancer of the breast and whose physician did not tell her the nature of the disease. Later she stated that she knew it was cancer, but didn't want to tell the doctor because he was so nice and she didn't want to make him feel bad.

Illness creates aloneness in the patient, but this aloneness is immensely greater in the patient with cancer than in other types of patient. The physician is the sole person who can dispel this aloneness. An honest association built by truthful statements creates an interpersonal relationship which is as great as any we find in this world. Each feels free to discuss this disease and its attendant problems and the patient is relieved of the consuming loneliness of the world.

It is an interesting fact that many patients, despite knowing very well the nature of their disease, will more and more be inclined not to mention it. Some few even convince themselves that they do not have cancer.

One may find fault with this attitude of frankness and honesty between patient and physician regarding cancer, saying that the patient loses all hope and retreats into a mental collapse upon hearing he has cancer. Certainly it will be true that perhaps one patient in ten thousand will commit suicide when possessed of the knowledge. The rest of the patients will be thrown into a profound depression, but soon, and not without the physician's help, they will rally their forces and assume a spirit of co-operation that is remarkable to behold.

In discussions of his disease one need not belabor the patient with details. Questions can be answered as they arise. The patient would prefer it this way. He wants to be able to find for himself a small glimmer of hope somewhere. You need not deprive him of it unless questioned point blank. Subsequently in discussing his cancer it is better to use synonyms, such as tumor, sarcoma, carcinoma, et cetera, rather than the word cancer, for the other less well known words have less of an impact upon the sensitive feelings of the patient.

Needless to say, the cancer patient, in his terminal state, is hypersensitive to his environment. Loud noises bother him, confusion is irritating, smells are accentuated and meanings of words are easily twisted. It is trying to the physician to have to be constantly on guard to prevent irritations, but this is part of the total treatment.

Presented at the annual staff meeting of St. Joseph's Hospital, Saint Paul, Minnesota, January 17, 1956.

Hard as it may be to see the patient when no word of cheer or statement of improvement can be given, you must not skip seeing these patients regularly on rounds. The physician's visit is the most important part of the day for the patient. Don't deprive him of it!

The hospital care of the terminal cancer patient is generally easier to conduct than home care. One great drawback in hospital care is food. Special attention must be paid to what the patient can eat and to how it is presented. He must be encouraged to eat what he can and this must be made palatable and attractive. Considerable burden is placed on the dietitian and the hospital kitchen to try to make the food attractive and edible.

Control of pain is a variable factor. It may be simple or very difficult. Pain, particularly from bony involvement, may be excessive before it is possible to demonstrate changes on x-ray. Often such large doses of narcotics are necessary that the patient becomes addicted to the drug and is apt to display the unpleasant side-effects of addiction such as querulousness, irritability, lying and paranoia.

Chlorpromazine is useful in controlling the nausea which so frequently accompanies carcinomatosis. It must be remembered that chlorpromazine may potentiate the effect of the narcotics; in fact, this action may be so marked that care must be used in regulating the dosage of the narcotic for profound depression of physiologic function may result even to the point of cessation of respiration if doses of narotics are too large. Cobra venom may exert a beneficial effect in potentiating narcotics. Recently we had a patient with carcinomatosis from breast carcinoma who made the statement that with the cobra venom life was bearable, but without it the pain was severe in spite of continued use of the same dose of narcotic.

Nerve block by injection with alcohol or nerve section often relieves pain in a localized area but more often one must resort to cordotomy (more properly—spinothalamic trachtotomy) to afford relief of widespread pain. This operation is not without some unpleasant side-effects, but is a boon to the individual who is expected to live some period of time with persistent severe pain. Finally, prefrontal lobotomy may be resorted to. It is interesting that this operation does not relieve the pain, but it does away with the affective component of the pain. The patient, after lobotomy, when questioned says "Yes, I have the pain but what of it?" Personality changes of varying degree attend this operation, so that it is advisable to rely on other pain relieving measures as long as possible.

The beneficial effects of x-ray therapy in relieving pain are well known and even though a cure may not be effected with such treatment the palliation may be great. Cobalt therapy has the same effects as x-ray therapy, but may allow a greater dose of radiation to be delivered to the tumor without damage to the skin because of the selective emission of rays. Radioactive gold has had some success in terminating or decreasing the accumulation of fluid in serous cavities; however, in general, the same or better results can be obtained by the use of external radiation. Nitrogen mustards in the treatment of pleural fluid collections fall into the same category as radioactive gold. Ordinarily if radiation is not effective neither is the nitrogen mustard treatment. Of course, we must not forget the simple palliative measures such as paracentesis and thoracentesis merely to make the patient more comfortable.

Refrigeration was studied quite thoroughly about fifteen to twenty years ago by Temple Fay, who found that the cancer was held in abeyance by the refrigeration process but that once the individual was warmed to normal levels the tumor began to again to grow. At present, Dr. F. John Lewis is reopening this investigation to determine whether or not a more uniform refrigeration, as obtained by new hypothermia machines, will be more beneficial than the older methods.

Care outside of the hospital may be undertaken in a cancer home or in the individual's own home. Certainly if the family can possibly care for the patient in the home, it is a great kindness to the patient to allow him to be with friends to the end. This is often not possible and a cancer home must be resorted to. How does one explain to a patient that he is being sent to a cancer home if one has not been completely honest about the nature of the disease? It is simple—you can't!

A considerable burden is placed upon the family to take the care of the terminal cancer in the home. It is a task of unending attention, but has its rewards in the happiness of the patient. A rented hospital bed is one of the first requirements for facilitating the nursing problems and making the patient a great deal more comfortable than he otherwise would be. Dressings often must be obtained in quantity. These will be furnished and delivered by the local chapter of the American Cancer Society. Assistance in nursing problems can be had from the Family Nursing Service or American Cancer Society. Should the patient have to be taken to the hospital for x-ray treatments or other treatments, transportation will be furnished by the American Cancer Society.

Control of pain, at home, is similar to that in the hospital save that the family must be taught to give hypos. Your office nurse or the nurses at the hospital will teach the family how to handle the hypodermic injection problems. Liquid medications such as Demerol, Dolophine, Levodromaran, et cetera, are better than pills for they are easier to handle. One dose ampules, with color breaks, help to avoid the problem of contamination. Ampins of morphine, though expensive, are useful when morphine is needed.

Those responsible for the patient should be taught how to care for the skin and how to avoid trauma to pressure points in order to prevent the development of decubitus ulcers. Careful use of pillows, frequent turning of the patient, cleanliness of the back and gentle massage of the skin will pay dividends in the long term care for after decubitus ulcers once develop the care and treatment becomes a sore trial. Artifices and skills are put to a test in preparing food for the cancer patient who has no appetite. This is particularly true of the person who is receiving x-ray therapy. A useful ruse in getting protein into the anorexic patient is to dissolve gelatin in coffee—but don't let the coffee get cold for if it does the liquid will jell.

Above all try to keep the patient occupied! Constructive activity helps to pass the hours away and keeps the mind off of the symptoms of the disease. By and large the total care of the cancer patient resolves itself into kindness, honesty, thoughtfulness and gentleness.

Walt Whitman has said, "The faithful hand of the living does not desert the hand of the dying."

GLAUCOMA AND THE FAMILY DOCTOR

(Continued from Page 612)

coma are extremely vague. The general practitioner is in a good position to help in the control of blindness due to glaucoma because he sees these patients earlier and more frequently than the ophthalmologist. He should be suspicious of glaucoma in patients with rapidly increasing presbyopia, fleeting obscuration of vision, occasional presence of halos, a family history of glaucoma, eye discomfort after a stay in the dark (as in a movie), poor dark adaptation, et cetera. It has been recommended by Zeller and Christensen, and I agree with them, that tonometry be made a routine part of every physical examination. There are 20,000 persons in this country who are totally blind from glaucoma (12 per cent of the adult blind population) and there are another 150,000 who are blind in one eye from glaucoma. Although exceptions do occur, without treatment the disease is progressive and results in absolute blindness. In the average case the end result depends essentially on two factors, the stage at which the patient comes under treatment, and the sustained adequacy of the treatment. It is impossible to give an accurate prognosis on primary glaucoma, but under adequate treatment in about 70 per cent of the cases the disease would probably be adequately controlled and stabilized, 20 per cent of the patients would slowly deteriorate but retain sight until death, while 10 per cent would do badly and become blind.

Current Concepts

PHYSICAL SIGNS OF FUNCTIONAL HEART DISEASE

GEOFFREY BOURNE
London, England

Tachycardia from nervous causes can sometimes simulate such a condition as paroxysmal tachycardia. In functional tachycardia the cardiac mechanism remains normal, and the rate although high varies measurably with such things as posture, exercise, and rest. In paroxysmal tachycardia the rate remains practically constant in the individual case whether the patient is resting or not.

The normal heart sounds vary to some extent. The first sound for example in nervous young adults may be louder and more abrupt than normal, and its quality may be impure. These changes may even lead to the suspicion that there is early mitral stenosis. Such an organic lesion may be without demonstrable changes radiologically or in the cardiogram. The exaggerated first sound of the normal excitable heart has to a musical ear a low pitch, that of early mitral stenosis a high one. The differential diagnosis in such cases may be further confused by the presence of a physiologic third heart sound. This is a distinct isolated and clearly limited distant little thud and heard at the apex. It is usually more audible towards the end of expiration, and particularly when the patient is in the left lateral position. This postural accentuation is of course characteristic also of the diastolic and presystolic murmurs of mitral stenosis. The third heart sound is much briefer than the diastolic mitral murmur.

The experienced physician learns to distinguish a number of murmurs to which the label functional is best applied. The commonest of these is a systolic murmur audible at the apex and conducted not into the axilla but towards the left sternal border, and thence up to the pulmonary base. A second example is a systolic murmur restricted to the pulmonary conus area. A third example is a soft blowing systolic sound best audible at the apex and conducted into the axilla. At first hearing this murmur might seem to be difficult to distinguish from that of mitral insufficiency. It is however entirely limited to inspiration and is not produced inside the heart cavity at all. A further example, which is unique among functional murmurs in being present in diastole, is a rather short diastolic shuffling sound, sometimes quite distant and suggesting the diastolic murmur of aortic incompetence. This murmur is heard at the pulmonary base, sometimes also the aortic base. It is not conducted downwards as far as the true murmur of aortic regurgitation, and it may be made to disappear completely during full inspiration. It also is no doubt exocardial in origin. All of these murmurs exist without symptoms, and any other demonstrable abnormality in the heart or cardiovascular system, clinically, electrocardiographically, or radiologically.

The physical explanation as to the cause of these functional murmurs is as yet unknown. Their obvious innocence in the eyes of cardiologists of experience will no doubt give them immunity from investigation for a further period of time.

HOUSING DECAY

A review of housing conditions in any one of our major cities discloses the communicability of housing decay. Like measles among a susceptible population, it spreads persistently from block to block, from area to area, infecting all who have not previously succumbed. Epidemiologically, there is first the contagion of housing endodecay which encourages the use of damp, unlighted, and unventilated rooms and results in room overcrowding and insanitary practices. Second, there is the contagion of housing exodecay which begins with neighborhoods and blighted areas creating shabby properties with decreasing values to be shunned like an exotic plague. Henry F. Vaughn, Dr. P. H., *Am. J. Pub. Health,* March, 1956.

Dr. Bourne is Physician-in-Charge, Cardiological Department, St. Bartholomew's Hospital, London, England.
This is the second in a series of four articles by the author on this subject.

Editorials

John F. Briggs, M.D.
Arthur H. Wells, M.D.
Henry G. Moehring, M.D.

ELECTROKYMOGRAPHY

Tracing Cardiovascular Pulsations on the Fluoroscope

Electrokymography was developed in the postwar years as a new method for investigating the pulsations of the atria, ventricles, and large vessels. It represents a canny combination of the x-ray and the electrocardiograph, the galvanometer of the latter being used for recording the pulsations of the various structures as revealed on a special, small fluoroscopic screen.

Excessive hopes of early workers led to disappointment when it was proven that exact physiologic determinations are beyond the possibilities of the method. Both changes of volume and intrinsic motions of the various structures, density changes, and border motions affect the tracing. The heart sometimes flops within the chest at each cycle and a sick, enlarged heart has greater shifts and does more flopping than a normal one.

In spite of these limitations, which are inherent in the physiologic setup to be studied, extremely interesting data have been gathered. The most significant are those obtained in rheumatic heart disease (where the dynamics of the left atrial chamber are deeply changed by lesions of the mitral valve) and in coronary heart disease (where the scarred ventricular wall may behave in an entirely different fashion from the normal wall). Some promising data have been gathered in cases with aortic or pulmonic stenosis, coarctation of the aorta, cor pulmonale, aortic aneurysms, and constrictive pericarditis.

The method is still in its infancy and may become a useful addition to x-ray and fluoroscopy of the heart. It is less used than it deserves because the results obtained by unskilled workers, often using poor technique, has cast some discredit on the method. It should be kept in mind that interpretation of an electrokymogram requires a moderate physiologic knowledge of the various motions of the heart and vessels and a certain training in roentgenology.

Technique.—Certain technical rules should be followed in order to obtain clinically adequate tracings. The following apparatus are needed:

1. A carefully checked x-ray apparatus (best if full-wave rectification is used).
2. A good pick-up including a rapid fluoroscopic screen.
3. An electric filter.
4. A recording galvanometer with possibility of recording films at 75 mm/sec.
5. A simultaneous tracing for timing (carotid pulse or phonocardiogram). The patient should be lying down (children) or sitting (adults), and the tracing should be taken in apnea.

Several positions of the pick-up and the patient can be used. The operator should become familiar with all of them, so that he may select those which are the best suitable for the study of the particular cardiovascular structure which is involved. Indication should be given on whether the tracing is a border tracing or a densogram.

With the above precautions and a moderate training, information of importance can be gathered and the correlation of this with clinical, phonocardiographic, electrocardiographic, and roentgenologic data gives a complete evaluation of the cardiac condition.

A. A. Luisada, M.D.

SERODIAGNOSIS OF CANCER

On page 571 of this issue of Minnesota Medicine begins an article concerning the present status of "the seroflocculation reaction." The author, Dr. Penn, states that this reaction "may prove to be an object of research of interesting and important heuristic value. . . ." For those of us, such as myself, who may not be familiar with the last-mentioned adjective, "heuristic" is a term that can be applied to arguments and methods of demonstration that are persuasive rather than logically compelling; such methods are designed to lead a person to find out things for himself.

Seroflocculation refers to flocculation produced in blood serum by an antigen. A variety of seroflocculation reactions are possible, the number of which is limited only by the ingenuity of investigators in thinking of antigens to add to serum. A familiar example is the Henry seroflocculation reaction for malaria, in which the antigens are nonspecific melanotic substances and fine-grained iron. The antigen used in the particular seroflocculation test under consideration originally was derived from the livers of persons who died of cancer. Naturally, then, interest centers around this reaction as a possible diagnostic test for malignant tumors.

The development of a simple test for the detection of cancer that would be applicable as a practical and accurate screening diagnostic procedure has occupied the interest of many investigators for many years. Thus far, the attainment of such a technique appears to be comparable to the caging of a will-o'-the-wisp. The requirements of a good test for cancer are stringent. The technique should be simple and easily reproducible. It should be of high specificity so that positive results will be found only in association with malignant tumors. False negative reactions should not occur. Positive and negative reactions should be sharply demarcated, with a minimal zone of doubtful reactions. A paragon such as this might appear to be a Utopian dream; however, many current routine immunologic and chemical tests approach this degree of specificity, accuracy and reliability. It is regrettable that no test for the detection of cancer available at present can remotely qualify for these requirements.

Analyzing a series of 763 cases, Dr. Penn's group found that a recent version of their seroflocculation test gave more than 90 per cent correct diagnoses of histologically proved malignant tumors. This percentage was based on 185 cases of verified cancer of various stages and categories. Dr. Penn does not mention the incidence of false positive reactions in the present article. Other reports of his group have stated that this series of 763 cases included 262 instances of noncancerous disease; positive reactions were obtained by the routine 2-tube qualitative technique in 37 per cent of these patients who did not have cancer, and positive reactions were obtained in 16 per cent by the technique of quantitative dilution of serum. The 763 cases also included 316 "normal" persons; the incidence of positive results among these was 9 per cent. Therefore, Dr. Penn wisely and correctly has emphasized that this particular seroflocculation test in its present state of development is not a specific diagnostic procedure for cancer.

Let us assume that a test for cancer gives 90 per cent correct results and 10 per cent false positive reactions. These figures for both sensitivity and specificity are better than those provided by most "tests for cancer" now available. Let us apply such a hypothetic test as a screening procedure to 1,000,000 "normal" people. Let us assume arbitrarily that one in 500 of this group has an unsuspected cancer. The test, then, will detect 1,800 of the 2,000 cancers present in such a group. At the same time, however, false positive reactions will be reported for 99,800 persons who do not have cancer. It is obvious that great expense will be entailed for subsequent diagnostic work to rule out the presence of cancer in these persons, to say nothing of the mental anguish imposed on healthy persons by such faulty results.

Because a reliable test for cancer is not available at present, the early detection of malignant tumors still depends on education of the public and constant vigilance on the part of the physician. The only satisfactory current method for the identification of cancer is the use of biopsy and of cytologic examination of smears.

George G. Stilwell, M.D.

VALUE OF A SAVINGS ACCOUNT

The value of saving money is synonymous with the reasons why people save. The principles of why people save have been inherited from the past and vary only slightly with the standard of living of any period. Thus, the basic reasons for saving today are the same as they have been throughout history. These inherent reasons are old because saving is as old as history. We know, for instance, that saving was common in Babylon nearly forty centuries ago, or two thousand years before Christ. Savings accounts can be traced to the old temples of Greece and to the fourth century of the Great Roman Empire. Saving reached a high level of activity in the early part of the sixteenth century in Venice. Saving lost ground in England about 1640, when Charles I raided the Exchequer to such an extent that people, their confidence shaken in government depositories, turned to goldsmiths for protection of their valuables. We in Minnesota have a fine record of saving inherited from European countries. Our early pioneers brought with them this habit which has been handed down from generation to generation.

Throughout the years several studies have been made to determine the answer to the question, "Why do people save?" Not long ago the department of economics at Harvard University published a study by Professor Dusenberry, in which he points out that there is a constant conflict between a person's desire to improve his current standard of living and his desire for future welfare by savings. On one side, there is the demand upon our budget for the many things we could have to improve our standard of living. On the other side of the conflict is our concern for our future welfare, which can be divided into two headings: (1) Saving for the events we hope will *not* happen; and (2) saving for the events we hope *will* happen.

The Saving Research Center of the University of Michigan delved deeply into the subject a few years ago. Their survey clearly shows that emergencies and sickness head the list of reasons most people give for saving. The purchase of automobiles and other durable goods ranks second, and general living expenses third. After that came repairs to the house, travel, education, moving and buying a home, in about that order.

Certainly one must agree that the reasons for saving are of extreme importance. This being true, the "Value of a Savings Account" is obvious. Saving is the method or the key to our future welfare.

Elmer D. Dufva, *Assistant Cashier*
The First National Bank of Saint Paul

PHOTOENGRAVING

Photoengravings, for our purpose in this discussion, will be treated as two distinct operations—line engraving as distinguished from halftone engraving.

To begin with, in making a line engraving on zinc or copper for use in letterpress printing, we start with a line drawing either in pen and ink or crayon. The crayon, however, must be black or nearly black in tone, otherwise the camera will not pick it up in sufficient strength or density to hold when printed on metal and etched.

The drawing or photograph is placed on the copy board in front of the camera, which is on a movable base, which can be moved forward or backward depending on the size of the enlargement or reduction. There are five basic steps involved in making an engraving.

The camera works just like any roll film camera that one might use for taking snapshots, with some exceptions:

1. The film we use is very slow, and exposures range from ten seconds for line negatives to three minutes for halftone negatives. In taking a snapshot the exposure runs from 1/25 to 1/100 of a second.

2. Our film comes in rolls, like the ordinary kodak film, only the rolls are 9½, 13, 19, 30, and 43 inches wide and 100 feet long.

3. We roll the film out on the camera to the desired length, using the proper width film and cut it off by pulling a knife which is contained in the film box, so we can develop one negative at a time.

4. When making a halftone from a photograph, a screen is used in front of the film and back of the lens, in a holder provided for this purpose. The screen breaks up the continuous tone photograph such as a portrait, into a series of dots, necessary for printing with ink on paper. The fineness of the screen to be used depends on the stock or paper on which the halftone is to be printed. The rougher the surface of the paper, the coarser the screen that must be used. In printing an etching, this is not important because we are printing solids. For guidance in selecting the screen for a particular stock, we suggest 60 line for general newspaper work, 100 line for magazine, 120 line for No. 2 enamel, 133* for high grade enamel, and 150 on the best enamel paper.

5. When the negatives have been made and developed, they are assembled on a sheet of glass. This is done for two reasons:

(a) In the interest of economy, negatives can be grouped with others so they can be handled through the printing and etching steps as one unit. If they were handled singly through the various steps, the cost would be prohibitive.

(b) Assembly of complicated layouts, where we are combining line negatives with halftone negatives, becomes possible by stripping or fitting these units together on one piece of glass. The film comes on an acetate backing, is very thin and is readily stripped off this backing when it has been thoroughly moistened.

Now we have the image in filmform on glass either in line or halftone. This then is printed on metal, similar to printing on paper with the ordi-

---

This is the second in a series of editorials by the author on this subject.

*For Minnesota Medicine, halftone cuts are made with 133 line screen.

nary snapshot negative in a photo studio. Clean metal, either zinc or copper, is coated with a light sensitive enamel which becomes an acid resister after developing and drying.

The negative is placed face down on the metal and brought in overall contact by vacuum in a vacuum frame and then exposed for five minutes under arc lights. It is then developed and dried. One type of enamel is developed with water, the other with alcohol. Halftone prints on copper are dried and baked to a dark color so the image can be seen. Zinc is dried and is ready for etching without heating, since the developer contains a dye that brings out the image.

Areas exposed to the light during printing become set or fixed and do not develop off the plate. Unexposed areas do not stay on the plate in the developing process and so leave exposed bare metal. These bare metal areas will be etched into or partially etched away to the required depth for printing on paper.

Etching, finishing and the further steps of making an engraving will be discussed briefly in the next issue.

W. W. Chreiman
Manager, Graphic Arts Division
Buckbee Mears Company

COLOR TV—THE BIG QUANDARY

The fall and winter of 1955-56 were touted as the time for "The Big Push In Color Television." Aware of the new emphasis on color in automobiles, in home furnishings, and in clothing, the men who translate today's experiment into tomorrow's standard were convinced color TV would come into its own.

So far, it hasn't. Programs in color have increased something like 500 per cent. Big screen color receivers are available for sale. But color TV has been slow to "catch fire."

Part of the reason why is the dilemma facing this new development. Up until now, the public has not bought color receivers in quantity, because there were not enough programs in color. There have not been many programs in color because there were not enough color sets out to justify the extra trouble and cost of color program production. There has been no appreciable decline in set prices—which range from $500 on up.

There are something like 10,000 color sets in the United States, compared to 37 million black and white receivers. In the Twin Cities, there are an estimated 400 color sets—and 609,000 black and white receivers. It's obvious the telecasters must give first thought to their larger audience which watches black and white TV. There have been some complaints that programs originating in color produce a "soft" picture on black and white sets,—a picture less crisp and distinct than the familiar black and white originations.

In any event, if color television is to boom, something has to give. There's no doubt color adds a great deal of life and depth to the television picture. The industry is producing more and more programs in color—working to create viewer enthusiasm, increase orders for color sets, and permit mass production to get rolling—with its resultant decrease in unit price for sets.

WCCO-TV is equipped to originate "live" color programs from its studios, and has presented a dozen or so of them. KSTP-TV has installed equipment to telecast slides and film in color. Both stations have been transmitting CBS and NBC color telecasts in full color for more than a year.

All in all, several million dollars are riding on a wager that once you have seen television in glowing natural color, you'll want a color receiver in your own home. But, like everything else in the television industry, it boils down in simplest terms to public demand. It's up to you.

Gene Godt
WCCO Radio and TV

THE HISTORY OF GLASS CONTAINERS

Though mechanical processes had long been in operation in other forms of glassmaking, no one had yet devised a way of shaping the neck and shoulders of a bottle automatically. Then, while various mechanical improvements had been introduced by 1900, no machine was entirely automatic. In 1903, the first fully automatic bottle machine was invented, and the glass container industry progressed further than it had at any time since the invention of the blowpipe some two thousand years earlier.

Overnight, metal arms revolving in endless succession around a vertical axis replaced the arms of glass blowers. Overnight, compressed air replaced lung power. Most important, this mechanical marvel soon delivered an endless succession of bottles to annealing ovens at the incredible rate of a mil-

---

This is the fifth in a series of editorials on this subject.

lion a week! Called the father of mechanized glass, Michael J. Owens was the inventor of the first entirely automatic bottle-making machine. Though similar machines were to be patented later by others, Mr. Owens is credited with revolutionizing the glass container industry.

Mechanization wrought many changes in the glass container industry during the next half century. Original machines were, of course, perfected considerably through the decades. Research, on which millions of dollars were spent, lead to improved production techniques and an improved product. Machine-made bottles, being uniform, made high-speed automatic capping and sealing machines possible. New plants sprang up. The result: An increasing number of glass containers bearing foods, beverages, drug and cosmetics and chemicals found their way into American homes.

The efficiency of the glass package also depends upon its closure, glass containers, of course, being incomplete without a cap, and the closure industry has kept full pace with the remarkable progress of the glass container industry in the last half century. Cork stoppers, screw caps, lug caps, crown pry-off, friction-type closures and others, each with special advantages, are all applied today by high speed machines in a single operation, making possible the wide range of products now available in glass to American consumers.

In some ninety glass container plants located throughout the United States today, automatic machines, each consisting of some 10,000 parts, are producing glass containers at speeds as high as 250 a minute. Annual production in the United States is now in the neighborhood of 18 billion glass containers—or 112 for every man, woman and child in the country. Not only are these automatic bottle-making machines producing more glass containers, but they are producing better and stronger bottles than ever before.

John M. Foster
Foster-Forbes Glass Company

REHABILITATION IN PULMONARY TUBERCULOSIS

While Varrier Jones proceeded with his practical application of the idea of Hermann Biggs, other thinkers concentrated on variations of the theory of rest, in their belief that these alone would fit the patient for immediate return to his former conditions of home and work. Marcus Paterson introduced graduated exercise at the Brompton Hospital Sanatorium, on the theory that auto-inoculation, produced by controlled walking exercise, gardening and games, would build up resistance against further breakdown. This made little difference in the mortality rates, which continued at some sixty per cent within some five years of discharge, for fully sixty per cent of those admitted with more than early disease. Others, who had not accepted the findings of Midhurst Sanatorium that a negative sputum merely postponed the date of breakdown and death for some two years beyond that of the positive case, pressed for continuance of sanatorium residence until sputum conversion.

Many pinned their faith on the addition of local to general rest. At the end of last century Kingston Fowler had stated his postmortem findings on the arrested state of the disease in cases found to have had a spontaneous pneumothorax at some time during life. He suggested artificial pneumothorax, which was introduced by Forlanini, and developed by such pioneers as Rivière, Lillingston, Pearson and Burrell. Similarly, during World War I, Gravesen of Denmark developed the thoracoplasty introduced by Sauerbruck of Germany. Artificial pneumothorax, like its allied pneumoperitoneum, is now out of fashion, although its physical results where refills remain in the hands of a single operator are often excellent. Thoracoplasty continues, albeit on a minor scale since surgeons have concentrated on excision, from segmental resection to pneumonectomy. Its results have not been those expected; by and large where it has been used as a single method of arresting disease it has had little better effect than extended sanatorium or medical collapse therapy, although many individual successes in long after-histories can be quoted.

Just before World War II, Wingfield and Macpherson of Brompton Hospital Sanatorium stressed the necessity for x-ray examination of supposedly healthy adolescents and young adults, if we were to find disease in an early stage before its insidious onset and development had deprived the patient of the possible benefits of collapse-therapy. After-histories were already proving that results in the average case with stage II or stage III of the disease were little better in 1935 than they had been in 1915. Mass x-ray examinations, developed from the work of de Abreau, were

---

This is the fourth in a series of editorials by the author on this subject.

quickly introduced at recruiting centers for the Armed Services, and did much good work in the discovery of unsuspected, symptomless disease. They have since been extended to civilian populations and to hospital admissions, after the example set by St. Joseph's Hospital in St. Paul.

At the end of World War II came streptomycin, quickly followed by its variants, and by drugs from P.A.S. to Isoniazid, all of which have now had trials as single agents or in combinations.

What all this means is that the method of treatment towards physical rehabilitation has changed very markedly in the last twenty years. The soil has become less important than the seed. Eradication of the bacillus is now the aim. We are back again to the belief that the whole future of the patient depends on the conversion of his sputum. Unfortunately, in the pursuit of this object the patient is all too often of secondary importance, with results which are deplored, but expected by those who believe that the real object of treatment is the full, physical, psychological, economic and social rehabilitation of the patient as an individual. The true physician must continue to treat his patient with disease, not disease in his patient.

R. R. Trail, M.D.
London, England

TROUBLE IS THEIR BUSINESS

On this very day a prisoner in California is being paroled to a new and better life; an unmarried mother in Pennsylvania is seeing her newborn child for the first time, confident of his future and hers; an alcoholic from Chicago's Gold Coast is being helped in his recovery from delirium tremens; a forty-six-year-old mountain resident in North Carolina is learning the alphabet; a thirteen-year-old girl in Indiana has received word that she is going to summer camp.

All of these things, and countless others, are possible because of the work of an international army whose pride is that no one fires a gun or knows how to thrust a bayonet. This is an army composed of hundreds of thousands of active soldiers led by an international corps of over 32,000 officers and cadets who battle in eighty-five countries throughout the world.

They speak in 102 languages and dialects, work outdoors or inside, in rain, snow or sleet. They pop up in the strangest places—after a Japanese earthquake, a New England flood, an Indian famine or a Mexican epidemic—anywhere disaster has struck and help is needed. Within several hours of a hurricane, flood or fire, a patrol of soldiers, headed by an officer and equipped with the latest in mobile canteen and service trucks, will appear on the scene and quietly set to work.

The stumbling bum of the slums, the distraught unmarried mother, the lost derelict, the prisoner and the paroled, the dope victim, the wounded and dying of the city's streets are the people who know this army well. But the ordinary citizen also recognizes them: A cheerful uniformly-dressed band of dedicated men and women who work, sing and preach in countless cities throughout the world—The Salvation Army.

These are a trouble-hunting bunch of people who go out of their way to look for it. Trouble is their business and they have organized to fight against it in a highly efficient manner.

Are you unemployed? Hungry? Friendless and lost? Hurt and disabled? Need spiritual comfort and help? The Salvation Army not only steps in, it seeks you out, finds you, and helps you find yourself—giving you every aid in its repertoire of helpfulness.

Twenty-four hours after the recent California floods brought havoc to helpless thousands, members of The Salvation Army were on the scene. Quietly, efficiently, trained soldiers worked to ease the destruction and pain. Knee deep in the muddy levee banks of swollen rivers, a worker wielding a shovel would suddenly straighten up and grin as he accepted a cup of hot coffee and one of the famous Salvation Army doughnuts. Hundreds of people were given first aid and warm clothing in newly set up mobile aid centers.

The sensational, headline-screaming catastrophe, however, represents only a small part of this Army's activity. It is the day-to-day work, carried on quietly and without fuss, that is basic. The singing and preaching on street corners is merely one method of calling people's attention to God and to the services The Army renders.

Just how busy The Salvation Army has been in the past year is revealed in some simple figures: Over 33 million meals provided free, 14 million in the United States alone; 11 million beds given to the homeless wandering. These are aids that bring no headlines.

Not only does it reclaim the degraded and the dissolute, attend to the poor and sick, but it goes all out to bring the gospel of Christ into the paths of the most wayward.

Almost 4 million youngsters attended The Army's 327 youth centers in this country, and 32,000 went to their summer camps. Over 10,000 unmarried mothers were given complete care and attention in the thirty-four Booth Memorial Hospitals and some 2 million patients were visited and comforted in various other hospitals and health centers. The Army runs eighty-eight employment agencies, 126 hotels, 109 social service centers. Its services penetrate every aspect of our society.

William Booth, an English Methodist minister, brought The Salvation Army into being in 1865 with a single purpose—to seek out and help the sinner and people without hope in the streets and sidewalks of the city.

Working in the slums of East London, he discovered his converts were refused admission in the established churches. He banded them together outside the church and in 1878 named his organization "The Salvation Army," setting up a devil-fighting unit along military lines, with uniforms, rank, strict training and discipline. So startling was their attack on evil and so overwhelming their success, that George Bernard Shaw, Britain's great dramatist, said of them: "Here is an army that substitutes the drum for the organ and actually fights the devil instead of merely praying at him!"

In 1880, a group of eight officers from England disembarked at New York's Battery Park and promptly held the first fully-authorized meeting in the United States. From this humble beginning, The Salvation Army in the United States now has nearly one-quarter million members and over 5,000 officers.

Who are these officers?

They are rigidly-trained people who attend a West Point-type training center (there are four in the U.S.: In New York, Chicago, San Francisco and Atlanta) for a year of study and welfare work. After another year of probation and field work they become fully commissioned officers. They advance in rank just as in the regular army, cannot marry or move without permission, and are given a modest salary.

It was in 1941 that The Army co-operated in initiating the idea of an interfaith organization to attend to the nonmilitary needs of servicemen. In short order such an agency, United Service Organizations (USO) went into effect on all fronts. In 1944, The Salvation Army's own Red Shield Clubs and other service clubs throughout the world, numbered 3,000. Over 27 million service personnel were served in these clubs in the U. S. alone.

While the street corner singing, the cup of hot coffee and the doughnut are sure marks of The Salvation Army daily at work, the growth of its ranks is the gauge of their effectiveness in driving the devil out of men's hearts. The Salvation Army is a devoted, hard-working team from which we can all take deep inspiration.

J. S.

WHY CONVENIENCE FOODS?

The increasing trend for the housewife to use convenience foods has been marked. Not only has this come about because of the convenience of prepared foods and dinners, but because there are very few families who at this time have servants or will continue to have servants in the future. A census recently revealed that less than 2 per cent of American households now have servants. Another factor in the development of the convenience foods has been the development of the single family home. This particular development has occurred throughout the entire country and with it has come a more basic interest in the home and in the kitchen and the preparation of the meals. Further, there is an increasing number of meals in which only one or two people partake. This decrease in the number of people partaking of any meal detracts from the incentive of preparing a large meal. As a result more and more people are turning towards convenience foods. In addition, mothers with large families find themselves so engrossed in raising their children that the convenience foods have given to them the time and opportunity to be with their family rather than slaving in the kitchen. Today the average housewife knows that a meal prepared from convenience foods will be as tasty and appetizing as any meal prepared by her mother or grandmother. The preparation of such a convenient meal gives her additional time to devote to her guests and enables her to spend less time in the kitchen.

The art of cooking has not been lost, it has been scientifically developed and conveniently arranged so that today the least experienced cook may prepare a most delicious meal.

J. F. B.

READERSHIP SURVEY

More than 10 per cent of the membership of the Minnesota State Medical Association formed the sample of readers of Minnesota Medicine interviewed by readership survey experts from the University of Minnesota School of Journalism at the Rochester meeting of the MSMA. This sample is considered representative except insofar as physicians who attend the State meeting and those who consent to be interviewed may form a selected group.

Some of the observations derived from the survey are:

Favorable spontaneous comments outnumbered the unfavorable in a ratio of three to one.

Two out of three subscribers to Minnesota Medicine think enough of its contents to save or clip issues for future reference.

Departments read from "occasionally" to "regularly" were, in order: Table of Contents, regular articles, editorials, General Interest, Reports and Announcements, Case Presentations, In Memoriam, Medical Economics, Clinical Concepts, Seminars, and President's Letter.

One out of six subscribers feels that Minnesota Medicine gives too much attention to some subjects.

Subscribers showed a strong preference for articles with immediate clinical application as opposed to more fundamental, scientific articles. They also indicated a desire for more articles of a short review nature.

About half of the subscribers consider Minnesota Medicine "above average" or "excellent" when judged against other general medical magazines. About one in twenty subscribers rated the magazine as "below average" or "poor."

Subscribers read Minnesota Medicine more often than they read the *Journal of the American Medical Association.*

The School of Journalism report on the survey had this comment: "Acceptance of the magazine appears to be high. . . ." This was in comparison with the numerous other similar studies the school has conducted in the past.

The detailed study of the survey's results is the continuing function of the Editorial Board. In the meantime, we express our thanks to the 356 physicians who gave us their time and the benefit of their knowledge and wisdom when they were interviewed.

H.G.M.

In Memoriam

NORMAN P. BENTLEY

Dr. Norman P. Bentley, a St. Paul physician for thirty-eight years, died August 6, 1956. He was sixty-eight years old.

A graduate of Syracuse University Medical School, Syracuse, New York, he practiced medicine at Cape Vincent, New York, before moving to St. Paul in 1918. He was a World War I veteran and a member of the American Legion and Masonic Lodge at Belmont, New York, a member of the Izaak Walton League, the St. Anthony Park Association, the Kiwanis Club and a life member of the St. Paul Athletic Club.

Dr. Bentley's memberships also included the Ramsey County Medical Society, the Minnesota State Medical Association, the American Medical Association, and Phi Beta Pi medical fraternity.

Funeral services were held August 9 in St. Paul with burial in Cape Vincent, New York. Surviving Dr. Bentley is his wife, Helena.

WILLIAM H. HOLLAND

Dr. William Howard Holland, a physician at Fisher, Minnesota, since 1909, died in July, 1956. He was seventy-five years old.

Born in Vernon Center township, Fond du Lac County, Wisconsin, he graduated from the Hamline University Medical School in 1908 and served his internship at Luther Hospital, St. Paul. From there he went directly into the practice of medicine at Fisher. He served on the staff of Bethesda and St. Francis Hospitals in Crookston, Minnesota, and was a member of the Odd Fellows and Royal Neighbors of Crookston.

Dr. Holland was also a member of the Red River Valley Medical Society, the Minnesota Medical Association, and the American Medical Association.

Survivors include one son, Howard, Fisher; two daughters, Mary (Mrs. Carl Olson), St. Paul, and Evelyn (Mrs. Dow George), Winter Park, Florida.

TIMING OF BIRTHS

More babies actually are born in the "gruesomely early hours of the morning" than at any other time, according to an analysis of more than 33,000 births occurring in five hospitals in three states.

By tabulating the births on an hour-by-hour basis, it was found that more births consistently occurred between 3 a.m. and 11 a.m. than at any other time of the day, and 48 per cent more births took place at the peak hour, 5 a.m., than at the low hour, 7 p.m., Dr. Peter D. King reported on the study in *Science.* Cesarean sections, recond or third babies in multiple births, and mid or high forceps deliveries were excluded from the series.—Notes and Comments: *Journal of the American Osteopathic Association,* 55:692 (July) 1956.

President's Letter

THE PRESIDENTIAL ADDRESS

Did you ever sit down on a hot evening in July to write a letter that must be submitted to the state office by the tenth of August so that it can be published in the September issue of a journal—a hot evening when you would much prefer being out on the river in your speed boat, and would be, if said speed boat had not been in dry dock for three weeks, right in the middle of the boating season? Then add to that another question: "What's the use; who is going to read it anyway?"

Answer those questions and you will know one of the joys of being your president.

Seriously, because it is a hot night, I would like to limit this letter to a suggestion for a change in procedure at our annual meeting, or, more specifically, the program at our annual banquet.

Usually the president of the host society or someone selected from the host society presides, and our annual dinner program in general consists of: (1) Introduction of the president of the Woman's Auxiliary and other honored guests, (2) presentation of Southern Minnesota Medical Association Award, (3) presentation of Fifty Club certificates, (4) presentation of Distinguished Service Medal, (5) presidential address, and (6) the main speaker of the evening.

One reason for suggesting a change is that the program is too long; it is difficult to keep people from getting restless or bored for that length of time.

My second reason for suggesting a change is that it is difficult for the speakers, and probably more difficult for the audience, to have both the presidential address and a featured speaker on the same program. I'm sure most of our audiences get a little impatient with the president's address, because the featured speaker is to follow and the evening is dragging on.

My third reason is that it is difficult for a president to prepare an address that will hold the attention of a mixed audience of physicians and their wives. The physicians expect you to discuss some phase of medicine, either scientific or organizational, as related to your Association. If you do this, the wives are apt to be bored, so the address must be on a rather general phase of medicine if it is to hold the attention of all, and that limits your subject material considerably.

Having gone through an annual meeting and agonized over preparing a presidential address, there can be no ulterior motive in the suggestions I am going to make. The annual meeting and annual dinner is naturally the high spot in any president's term of office, and I feel he should have recognition as the man you have honored by electing him to that office; so my suggestion is this:

First, have your president make his presidential address to the opening session of the House of Delegates. There he would be talking to the representatives of organized medicine, and could confine his remarks to problems of organized medicine, a brief review of problems during the past year, and a summary of problems facing the present House of Delegates. He would have something to talk about that would be purposeful.

Second, have your president preside at the annual dinner, make a few brief introductory remarks, introduce the honored guests, the president-elect, the men who are going to present the awards, and the speaker of the evening.

I feel this would make your president's address of some significance and much easier to prepare, it would give him recognition at your annual dinner, and would definitely shorten the program. May I submit this for consideration by the Council and the next local arrangements committee?

R. H. Wilson

President, Minnesota State Medical Association

Medical Economics

Edited by the
Committee on Medical Economics,
Minnesota State Medical Association
George Earl, M.D., Chairman

PRESIDENT SIGNS SOCIAL SECURITY BILL

The controversial social security bill (H.R. 7225) is now the law of the land. Increased OASI taxes to support payments to the disabled at age fifty become payable January 1, 1957. Disability benefits become payable July 1, 1957. Until and unless new regulations are issued, physicians will follow the same procedure in connection with this new law that they follow under the disability freeze amendment now in effect. The doctor makes his medical findings and turns in his report to the state agency in charge. The decision then is made by the agency, based on vocational as well as medical findings, as to the applicant's disability.

PRESIDENTIAL SIGNATURE COMPLETES ACTION ON OTHER BILLS

Of the more than twenty health measures carried during the past session in the AMA "legislative boxscore," Congress failed to pass only six. Presidential approval completed the enactment of a new law establishing a new mental health program for Alaska and authority for commissioning osteopaths as medical corps officers. Other bills still awaiting White House approval in mid-August were the Little Omnibus Health Bill and the creation of a National Library of Medicine.

The President also signed into law a bill authorizing appointment of Army or Air Force women reserve officers as nurses or women medical specialists in the Army or Air National Guard.

ADMINISTRATION URGES CONSTRUCTION AID TO MEDICAL SCHOOLS

President Eisenhower has criticized Congress for not voting the same type of assistance to medical schools as it has to medical research facilities. He recently signed a bill which provides a three-year federal grants program to help in constructing the research facilities and stressed the need "to extend the assistance to include the laboratories where future health research personnel are being devloped. In medical and dental schools, space for research and teaching functions are so closely inter-related with one another that no clear line can be drawn between them."

NARCOTICS CONTROL BILL PASSES CONGRESS

A bill to provide for a more effective control of narcotic drugs and marihuana passed Congress in July. This new law will strengthen the authority and methods of the Federal Bureau of Narcotics by permitting its agents to carry firearms, to execute and serve search warrants and arrest warrants, and in certain situations to make arrests without warrants. Also penalties for narcotics violators are toughened considerably with a prohibition on the granting of probation, suspension of sentence or parole with respect to any of the increased penalties applicable to traffickers.

The new law also includes a provision creating a specific offense of selling narcotics to individuals under eighteen. Any one *over* eighteen who knowingly sells or gives away any heroin unlawfully imported into the United States to a person who is under eighteen shall be subject to the death penalty if the jury shall so direct.

CABINET STATUS ASKED FOR U. S. CIVIL DEFENSE AGENCY

The next Congress will be asked to pass legislation creating a cabinet rank Department of Civil Defense and to make drastic changes in the entire national civil defense concept. Recommendations appeared in a report by the Holifield House Subcommittee following a year's study. The report was published just at the end of the 84th Congress. The proposed department would merge civil defense work of the Federal Civil Defense Administration and the Office of Defense Mobilization.

ALLOCATION PROGRAM OF SALK VACCINE ENDS

After approximately fifteen months the Federal government has stepped out of the allocation picture for the manufacture, distribution and use of the Salk poliomyelitis vaccine. From now on, unless an emergency requires reinstitution of the allocation program, distribution will be handled through normal channels. The U. S. Public Health service will still continue to notify states of the amount and the manufacturer when a new supply of vaccine is released and to receive information from manufacturers on the geographic distribution of sales.

$35 MILLION ALLOCATED FOR VOCATIONAL REHABILITATION

The Office of Vocational Rehabilitation announces the allocation to the states of $35 million for programs to help disabled persons overcome handicaps and obtain employment. In addition, another $2 million is available for grants to aid research and demonstration projects and $2.95 million for teaching grants and traineeships to qualify more personnel for work with the handicapped.

SEARS, ROEBUCK FOUNDATION ANNOUNCES LOANS

Assistance in establishing eleven new medical practices through thirteen loans to physicians was announced recently by the Sears, Roebuck Foundation. The loans, ranging from $3,000 to $15,000, were made under the Foundation's recently-established Plan of Assistance and totalled $71,500. One of the loans went to a physician in Northern Minnesota.

Purpose of the plan is to help physicians supplement personal and local financing when this is insufficient, especially in areas with inadequate medical care. The Foundation administers the plan, and screening and selection of applicants is done by a seventeen-member advisory board of physicians nominated by the board of trustees of the American Medical Association.

WEST GERMAN MEDICAL EDUCATION SURVEYED

Dr. J. Mather Pfeiffenberger, Alton, Illinois, and Dr. DeWitt Hendee Smith, Princeton, New Jersey, said after a tour of West German medical schools that teaching methods are changing and there is much construction of new buildings—some of which "would be envied by any medical school." They also found that research was going on not only in the universities but in smaller or remote hospitals, and that there is no attempt to limit the size of medical school classes even in the face of an admitted surplus of doctors. The surplus is mostly accounted for by the immigration from East Germany.

STUDY SHOWS AGED BECOMING LESS DEPENDENT

George Bugbee, president of the Health Information Foundation, believes that despite the increasing numbers of Americans age sixty-five and older, indications are that the aging will become less and less dependent. A recent study points out that although the proportion of older persons among dependents will increase, they will be supported by a working force of larger proportion. Work-life expectancy has increased, and death rates are being reduced through the whole life span, which means that the average family's risk of losing its wage-earner prematurely is also reduced. Also, more women of all ages are working.

FAMILY INCOME BEFORE TAXES UP IN 1955

The average "before-tax" family income in 1955 was three per cent higher than the previous year, the Commerce Department reported recently. Average after-tax family income in 1955 amounted to $4,980, compared with $4,850 in 1954 and $4,380 in 1947.

WOMEN PHYSICIANS OUTNUMBER MEN IN USSR

Russian women doctors outnumber their male colleagues by three to one. Apparent reason: the Soviet need for men in more rugged lines of work.

MEDICINE RANKED MOST DESIRABLE CAREER BY TEEN-AGERS

A Gallup study indicates that U. S. teenage males rank medicine as the most desirable career. Next two in order: science and law.

DOCTORS' FEES STILL BEHIND OVERALL COST OF LIVING

The *Wall Street Journal* reported recently that in spite of increased income, doctors' fees are still behind the overall cost of living. Most doctors are making more money because they are working longer hours and seeing more patients. Very little of the increased income is attributed to higher fees. In 1956, the cost of all types of medical care is expected to reach $11.8 billion, of which $3 billion will go to physicians. According to the *Journal,* auto-mechanics and repairmen will receive a billion more than doctors. U. S. Bureau of Labor statistics indicate general practitioners' fees have increased by 67 per per since 1939, while surgeons' fees increased only 56.5 per cent. In the same period, the overall cost of living has increased 92.8 per cent.

NUMBER OF SPECIALISTS ON THE RISE

The number of specialists in the United States has increased steadily since 1938. In that year there were 5,688 internists, in 1949 there were 12,079, and this year the number has jumped to 16,321. The number of pediatricians has gone from 2,205 in 1938, to 4,480 in 1949, to 6,567 in 1956. Total number of surgeons in 1938 was 5,397; in 1949, 10,363, and this year, 12,593.

PHYSICIANS CAN DEDUCT FOR REFRESHER COURSES

The U. S. Internal Revenue Service has just issued a regulation which is important to physicians.

Efforts over a long period of time by the AMA Law Department to get the Internal Revenue Service to issue a regulation permitting physicians to deduct their expenditures in taking postgraduate "refresher" courses have finally paid off.

The regulation, effective on August 9, 1956, provides that expenditures for education are deductible if they are for a "refresher" or similar type of course taken to maintain the skills directly and immediately required by the physician in his employment or business. An educational course to be covered should be designed for established medical practitioners to help them keep abreast of current developments in the profession; it should be of short duration; it should not be taken on a continuing basis, and should not carry academic credit. Education designed to prepare the practitioner to enter a specialty will not be acceptable.

When a physician travels away from home primarily to obtain "refresher" education, his expenditures for travel, meals, and lodging while away from home are deductible. However, expenses for personal activities such as sightseeing, social visiting or entertaining, or other recreation will not be allowed.

AMA REVISES PRINCIPLES OF MEDICAL ETHICS

Deferred for final action in Seattle in December is the revision of the Principles of Medical Ethics as reported by the AMA Council on the Constitution and By-Laws, Louis A. Buie, Rochester, chairman. The present principles are comprised of forty-eight sections. The proposed revisions are made up of ten sections. The revised Principles are designed to eliminate in the present code "verbosity and qualifying constructions of dubious value which in themselves engender confusion." The proposed revisions follow. If you have any suggestions relative to these proposed Principles, please send them to the Minnesota State Medical Association office, 496 Lowry Medical Arts Building, St. Paul 2, and they will be passed on to the delegates for discussion at the interim session in December:

Preamble

These principles are intended to serve physicians, individually or collectively, as a guide to ethical conduct. They are not laws; rather, they are standards by which a physician may determine the propriety of his own conduct. They are intended to aid physicians, in their relationships with patients, with colleagues, with members of allied professions and with the public, to maintain under God, as they have through the ages, the highest moral standards.

Section 1.—The prime objective of the medical profession is to render service to humanity with full respect for both the dignity of man and the rights of patients. Physicians must merit the confidence of those entrusted to their care, rendering to each a full measure of service and devotion.

Section 2.—Physicians should strive to improve medical knowledge and skill, and should make available the benefits of their professional attainments.

Section 3.—A physician should not base his practice on an exclusive dogma or a sectarian system, nor should he associate voluntarily with those who indulge in such practices.

Section 4.—The medical profession must be safeguarded against members deficient in moral character and professional competence. Physicians should observe all laws, uphold the dignity and honor of the profession and accept its self-imposed disciplines. They should expose, without hesitation, illegal or unethical conduct of fellow members of the profession.

Section 5.—Except in emergencies, a physician may choose whom he will serve. Having undertaken the care of a patient, the physician may not neglect him. Unless he has been discharged, he may discontinue his services only after having given adequate notice. He should not solicit patients.

Section 6.—A physician should not dispose of his services under terms or conditions which will interfere with or impair the free and complete exercise of his independent medical judgment and skill or cause deterioration of the quality of medical care.

Section 7.—In the practice of medicine a physician should limit the source of his professional income to medical services actually rendered by him to his patient.

Section 8.—A physician should seek consultation in doubtful or difficult cases, upon request or when it appears that the quality of medical service may be enhanced thereby.

Section 9.—Confidences entrusted to physicians or deficiencies observed in the disposition or character of patients, during the course of medical attendance, should not be revealed except as required by law or unless it becomes necessary in order to protect the health and welfare of the individual or the community.

Section 10.—The responsibilities of the physician extend not only to the individual but also to society and demand his co-operation and participation in activities which have as their objective the improvement of the health and welfare of the individual and the community.

PATIENTS' CODE OF CONDUCT REJECTED

Patients were brought under the microscope of the annual meeting of the British Medical Association in July. It was suggested that an enforceable code of conduct for patients be drawn up and that it be of "a persuasive rather than an obligatory nature printed on the medical cards." After debate, however, the Council of the organization decided not to pursue the idea because it thinks that "a large majority of patients are co-operative, and that such rules would not serve any practical purpose."

Who is primarily affected by the plague of housing decay? As in the case of tuberculosis, it is a plague of the people and not merely an affliction of the health director or his department. We could never expect to control tuberculosis without the understanding cooperation of the public. Tuberculosis services, case-finding programs, hospitals and sanatoria, rehabilitation services, financial aid for the patient and family, and the health department itself exist only because the public believes in them as a means toward success in the struggle against the tubercle bacillus. Health education provides the thread that binds the program together so that failure is denied.—HENRY F. VAUGHAN, Dr. P.H., and *Am. J. Pub. Health*, March, 1956.

NEW PROBLEMS IN THE TUBERCULOSIS FIELD

(Continued from Page 613)

later come in with far-advanced disease. Gastric cutlures might have been found positive earlier, and prompt retreatment might have prevented this tragedy for them.

This development of complacency toward tuberculosis on the part of the public is manifested by a decreasing case-finding program. Very recently six rural counties employed their own epidemiologist, who, with public health nurse assistance in two of the counties, found forty-six active cases which have had antituberculous treatment in the past year. Other more heavily populated counties which have never had as good a program are likely to harbor a similar proportion of active cases of tuberculosis if an all-out effort were made to find them.

If Minnesota really does want a reduced morbidity rate as well as a reduced mortality rate in tuberculosis, there must be an increased awareness that (1) tuberculosis is still infectious, (2) active, moderately advanced and far advanced disease is still present, (3) all patients do not turn negative on the antituberculous drugs in a short time, (4) patients who do not turn negative are infecting others with a potentially resistant organism, (5) many patients do not take the drugs at home as faithfully as would be desirable, (6) patients with tubercle bacilli in their sputum are likely to mingle with the public in spite of their promise to stay away and (7) small nodules and lesions stationary on x-ray can become far-advanced disease and need to be watched with repeated cultures as well as x-rays.

The public health conscience needs to beware lest the remarkable results of the antituberculous drugs exert a tranquilizing side effect which will end in an increase in tuberculosis with loss of time, money and life, and the addition of innumerable social problems.

With the advent of the newer drugs, and the great advance in surgery of the lungs, medical progress has slowly converted tuberculosis from a killing to a chronic disease. This is a great achievement. But, in changing the course from a killing to a chronic state, tuberculosis handicaps its victims, thereby creating a huge financial and emotional problem, which eventually threatens, with its ever increasing size, to stifle the medical economy of our communities.—I. PHILLIPS FROHMAN, M.D., *Ohio State M. J.*, August, 1955.

Meetings and Announcements

MEDICAL MEETINGS

STATE

MINNESOTA STATE MEDICAL ASSOCIATION, 104th annual meeting, Saint Paul, May 13, 14 and 15, 1957.

NATIONAL

American College of Gastroenterology, annual convention, The Roosevelt, New York, New York, October 15-17, 1956. Write American College of Gastroenterology, 33 W. 60th Street, New York 23, New York.

American College of Surgeons, sectional meeting, Hotels Lowry and St. Paul, St. Paul, Minnesota, April 8-10, 1957. Write Dr. H. Prather Saunders, Associate Director, American College of Surgeons, 40 East Erie St., Chicago 11, Illinois.

American Heart Association, 29th annual scientific session, Cincinnati, Ohio, October 26-29. Write American Heart Association, 44 East 23rd Street, New York 10, New York.

Conference on Health in Industry, Center for Continuation Study, University of Minnesota, Minneapolis, Minnesota, October 18-19, 1956.

Diseases of the Chest, 11th annual postgraduate course, Hotel Knickerbocker, Chicago, Illinois, October 15-19.

Diseases of the Chest, ninth annual postgraduate course, Park-Sheraton Hotel, New York, New York, November 12-16.

Centennial Exposition, 100th anniversary of the Academy of Medicine of Cincinnati, Music Hall, Cincinnati, Ohio, February 27-March 5, 1957.

National Society for Crippled Children and Adults, annual convention, Hotel Statler, Washington, D. C., October 28-31.

Interstate Postgraduate Medical Association of North America, Cleveland, Ohio, October 22-25.

San Diego Postgraduate Assembly, San Diego County Hospital, San Diego, California, September 19 and 20. Write Dr. Michael J. Feeney, 3415 Sixth Avenue, San Diego 3, California.

University of Illinois Department of Otolaryngology, Annual Assembly in Otolaryngology, October 1-7. Write Department of Otolaryngology, 1853 West Polk Street, Chicago 12, Illinois.

INTERNATIONAL

Inter-American Congress of Cardiology, Havana, Cuba, November 4-10. Dr. Ramon Aixala, Apartado 2108, Havana, Cuba.

International Cancer Cytology Congress, Chicago, Illinois, October 9-11.

Pan American Congress on Cancer Cytology, Miami, Florida, January 8-12, 1957. Dr. J. Ernest Ayre, chairman, 1155 N. W. 14th St., Miami, Florida.

Pan-Pacific Surgical Association, seventh congress, Honolulu, Hawaii, November 14-22, 1957. Write Dr. F. J. Pinkerton, director-general of the Pan-Pacific Surgical Association, Room 230, Young Building, Honolulu, Hawaii.

World Medical Association, Havana, Cuba, October 9-15. Dr. Louis H. Bauer, secretary general, 345 East 46th St., New York 17, New York.

AMERICAN COLLEGE OF CHEST PHYSICIANS ESSAY CONTEST

The council on undergraduate medical education of the American College of Chest Physicians is offering three cash awards for the best contributions prepared by undergraduate medical students on any phase in the diagnosis and treatment of chest diseases (heart and/or lungs).

First prize for the 1957 contest will be $500; second prize, $300, and third prize, $200.

The winning contributions will be selected by a committee of chest specialists and will be announced at the 23rd annual meeting of the American College of Chest Physicians to be held in New York City, May 29-June 2, 1957. All manuscripts become the property of the college.

Applicants are requested to study the format of *Diseases of the Chest,* the official journal of the college, as to length, form and arrangement of illustrations to guide them in the preparation of the essay. A copy of the journal will be sent upon request. The following conditions must be observed:

1. The completion of an application form, which may be obtained by writing to the Executive Director, American College of Chest Physicians, 112 East Chestnut Street, Chicago 11, Illinois.
2. Five copies of the manuscript typewritten in English (double-spaced) should be submitted to the college offices in Chicago not later than April 10, 1957.
3. The only means of identification of the author shall be a motto or other device on the title page and a sealed envelope bearing the same motto on the outside, enclosing the name and address of the author.

INFERTILITY ESSAY CONTEST

The subject for this year's Caleb Fiske Prize, offered by the Rhode Island Medical Society, is "The Present Day Treatment of Infertility." A cash prize of $350 will be awarded for the best essay on the subject, not over 10,000 words, submitted by January 10, 1957.

For further information write the Secretary, Caleb Fiske Fund, Rhode Island Medical Society, 106 Francis St., Providence 3, Rhode Island.

AMERICAN COLLEGE OF PHYSICIANS

The annual meeting of the Midwest Region of the American College of Physicians will be held in conjunction with the meeting of the Minnesota Society of Internal Medicine in Minneapolis on October 27. The scientific program will be held in the Mayo Memorial Auditorium on the campus of the University of Minnesota Medical School. The sessions will begin at 9:00 a.m. All physicians are invited to attend.

Dr. Wesley W. Spink, professor of medicine at the University of Minnesota Medical School, is general chairman of the meeting.

A course, "Recent Advances in Cardiovascular Diseases," is being held at The Mount Sinai Hospital, New York, October 8-12, 1956, under the auspices of the American College of Physicians. Co-directors will be Dr. Arthur M. Master and Dr. Charles K. Friedberg. Fees for members of the American College of Physicians will be $30.00, non-members, $60.00. Registration should be filed with the Executive Secretary, American College of Physicians, 4200 Pine Street, Philadelphia 4, Pennsylvania.

PSYCHIATRIC AIDE PROGRAM

The Minnesota Department of Welfare is offering a combined program of psychiatric aide and practical nursing education, under a grant from the National Institute of Mental Health. Graduates of the fifteen-month course will be competent to function in psychiatric hospitals, nursing homes and general hospitals. Classes will be held at Gustavus Adolphus College and St. Peter State Hospital, St. Peter, and St. John's Hospital, St. Paul. Total cost of tuition, fees, uniforms and books will be about $225, with board and room furnished free.

The course is open to high school graduates, aged 18 to 50, in good health, with character references, able to meet admission requirements of Gustavus Adolphus College. Classes will start in the fall and spring semesters. For further information write the Director, Psychiatric Aide Training Project, Room 220, 1111 Nicollet Avenue, Minneapolis, Minnesota.

HEART DISEASE PUBLICATION

Of special interest to the internist and other physicians wishing to keep abreast of new developments in the field of cardiovascular disease will be the plans recently announced by the officers of the Minnesota Heart Association.

The monthly publication, *Modern Concepts of Cardiovascular Disease,* which has been available to members of the Heart Association in the past, at an annual fee of $5, will now be sent without charge to any Minnesota physician who writes requesting it.

The contents of this well-written, concise, scientific publication make a useful reference addition to the medical library of the busy physician.

This service is being offered as a part of the Professional Education Program of the Minnesota Heart Association. All physicians are urged to avail themselves of this offer. Requests should be addressed to the Minnesota Heart Association, 1821 University Avenue, Saint Paul 4, Minnesota.

CONTINUATION COURSES

At the center for continuation study, University of Minnesota.

September	25-27, 1956	Pediatrics for Pediatricians
October	18-20, 1956	Techniques in General Practice
October	22-24, 1956	Gynecology for General Physicians
November	5-9, 1956	Radiation Therapy for Radiologists
November	19-21, 1956	Fractures for General Physicians

For further information concerning the above courses, write to the Director, Department of Continuation Medical Education, 1342 Mayo Memorial, University of Minnesota, Minneapolis 14.

GENERAL PRACTICE FALL REFRESHER

The Minnesota Academy of General Practice announces the Sixth Annual Fall Refresher to be held at the Prom Ballroom, St. Paul, October 17, from 8:30 a.m. to 5:30 p.m.

Fourteen lecturers will cover a variety of subjects, and the luncheon speaker will be **Dr. Claude J. Beck,** Cleveland. Also speaking will be **Dr. Michael J. Wohl,** Philadelphia, and **Dr. James L. Dennis,** Oakland, California.

Registration fee, including the luncheon, is $10, and inquiries should be addressed to **Dr. James A. Blake,** 15 Ninth Avenue South, Hopkins, Minnesota.

CRIPPLED CHILDREN SERVICES 1956 FALL CLINIC SCHEDULE

Place	*Date*	*Counties*
Grand Rapids	Sept. 19	No. Aitkin, So. Cass, Itasca
Little Falls	Sept. 22	Mille Lacs, Morrison
Hibbing	Sept. 26	St. Louis, West Range
Winona	Sept. 28	Fillmore, Wabasha, Houston, Winona, Olmsted
Virginia	Oct. 3, 4	St. Louis, East Range
Crookston	Oct. 5	Polk, Norman
Fergus Falls	Oct. 13	Otter Tail, Wilkin
Willmar	Oct. 20	Chippewa, Meeker, Kandiyohi, Renville
Alexandria	Oct. 27	Douglas, Pope, Grant
Mankato	Nov. 3	Blue Earth, Faribault, Waseca, Martin, Watonwan
Sauk Center	Nov. 8	Stearns, West Todd
Anoka	Nov. 13	Anoka, Kanabec, Chisago, Ramsey, Dakota, Sherburne, Hennepin, Wright, Isanti, Washington
Marshall	Nov. 17	Lac qui Parle, Lincoln, Redwood, Lyon, Yellow Medicine

Woman's Auxiliary

NEW PRESIDENT-ELECT PRACTICES WHAT SHE PREACHES

Playing the role of "propagandist in the field of public health, buffer for her husband and an active participant in civic affairs"—these are the primary functions of every doctor's wife, according to the new president-elect of the Woman's Auxiliary to the Minnesota State Medical Association.

Mrs. C. L. Oppegaard, Crookston, practices what she preaches, for she has a wide background of experience in educational and medical fields to qualify her as the future top officer of the organization. She comes from a medical family: her father is a doctor; her brother and sister are practicing physicians and two brothers-in-law were doctors.

Mrs. Oppegaard graduated from Carleton College, Northfield, Minnesota, with a major in chemistry and taught school in Crookston before her marriage.

Active in many local organizations, she has been a vice-president of the WSCS of her church, president of the Crookston AAUW, child welfare chairman of the Crookston Legion Auxiliary, a member of the PTA, has worked with the Campfire Girls and as a Red Cross Nurse's Aide during World War II.

Her interest in medical affairs is reflected in her activities with various tuberculosis organizations. She is currently president of the Polk County Tuberculosis and Health Association, is secretary of the State Executive Committee and a member of the governing council of the Mississippi Valley Tuberculosis Association.

Mrs. Oppegaard traces her Auxiliary work back to 1926 when she first joined the Red River Valley Medical group. She has served as its president and in many other capacities. Her Auxiliary embraces nine counties and the members are scattered so that keeping them informed is a major project. This Red River Valley group encourages members to keep informed on legislative problems affecting their husbands' work and urges participation in local groups where they can promote problems of health.

When they have a program to prepare for the PTA, Legion Auxiliary or church, members are urged to use films and available qualified personnel. Money remaining in the treasury at the end of the year is given to the AMEF. This year the Red River Valley group, under the leadership of Mrs. John Cameron, is concentrating on home nursing and other civil defense projects, stressing discussion of local problems as well as those of the National Auxiliary.

Locally, Mrs. Oppegaard has participated in the various activities of the Crookston Auxiliary. Each year this group organizes all the local help and furnishes lunches for personnel and patients of the annual orthopedic clinic. This project was started twenty-five years ago. Mrs. J. F. Norman was first chairman, then Mrs. Oppegaard, followed by Mrs. R. O. Sather, Mrs. Cameron and Mrs. S. H. Hirsch.

These many civic affairs tie in with Mrs. Oppegaard's philosophy on Auxiliary work: "To aid greatly in protecting the present form of medical practice and informing others contacted in other fields." She believes that instruction to "promote medical public relation" can come from membership in the Woman's Auxiliary.

GEORGE GRIM TO SPEAK AT SCHOOL OF INSTRUCTION

Popular *Minneapolis Tribune* columnist, George Grim, will be featured speaker at the annual Woman's Auxiliary School of Instruction for all state and county officers, committee chairmen and board members, Tuesday, October 9, at the Curtis Hotel, Minneapolis. Grim will give his impressions of medical practice and medical facilities as he observed them during his recent tour of Russia.

The October 9 "school day" will stress more effective program planning for county meetings and will stress accelerated support of the three major Auxiliary projects: TODAY'S HEALTH, AMEF, and recruitment in allied fields of medicine. A series of talks has been arranged to describe and even demonstrate how programs are put together and where to look for material. Questions and comment will be invited.

There will also be a talk on legislative matters and a new public relations film, "The Case of the Doubting Doctor," if it is released in time by the AMA.

Auxiliary President Mrs. L. P. Howell, Rochester, and President-elect, Mrs. C. L. Oppegaard, Crookston, will report on the national conference they will attend in Chicago, October 1-3.

Registration for the School of Instruction, to which all interested Auxiliary members are invited, will be at 9 a.m., October 9, at the Curtis Hotel.

Although the new drugs are a most helpful addition to our armamentarium, they are not a substitute for the tedious but progressively successful tuberculosis control program developed painstakingly over the last half century which will lead eventually to our goal of eliminating all tuberculous infections, in other words, to the goal of no reactors to the tuberculin test.—James E. Perkins, M.D., Managing Director, NTA, *Journal-Lancet,* April, 1956.

* * *

Physicians and organized medicine are rightfully if a little tardily assuming a more active role in health education. Health forums sponsored by local medical societies have served a most useful purpose, including the demonstration that the physicians of a community can work together and pool their efforts in a common cause. Hospitals need to take a more active part in health education for patients, and on a community basis, jointly with physicians and health officers.—L. E. Burney, M.D., *California Medicine,* January, 1956.

CORRECTS MOST TYPES OF CONSTIPATION

Metamucil® Blends with the Intestinal Contents, Soothes the Mucosa

Metamucil is highly refined; it stimulates the bowel musculature, not the mucosa.

When you specify Metamucil in constipation management you are selecting a product which has been made at least 99.6 per cent pure through a complete process of refinement.

All possible irritants (rough parts of the psyllium seed, undesirable oils and similar materials) are discarded during the refining process. A relatively small quantity of purified mucilloid powder is the result. To this is added an equal weight of pure anhydrous dextrose to insure complete dispersion in the colon.

Such meticulous preparation assures that only the bulk-producing mucilloid portion of the psyllium seed remains and that Metamucil will act as a purely "physiologic" constipation corrective, providing bland distention to stimulate the bowel muscularis.

The Metamucil mixture (formed by adding water to Metamucil) elicits gentle colonic reflex peristalsis. Evacuations are normally formed and are not irritating. The bowel stimulation imparted by Metamucil is only sufficient to clear the colon of its contents; patients are not annoyed by the repeated diarrheal evacuations that result from mucosal irritation by drastic cathartics.

The blandness of Metamucil makes it an ideal choice for constipation associated with a soft diet, constipation of pregnancy and in the aged and as an aid in reestablishing normal bowel habit after anorectal surgery. Daily use of Metamucil for a limited time will often return an atonic colon to normal function.

Metamucil® is the highly refined mucilloid of Plantago ovata (50%), a seed of the psyllium group, combined with dextrose (50%) as a dispersing agent. It is supplied in containers of 1 pound—also 4 ounces and 8 ounces.

G. D. Searle & Co., Chicago 80, Illinois, Research in the Service of Medicine.

SEARLE

General Interest

Minnesota physicians are invited to submit items of "general interest" concerning themselves or their colleagues to MINNESOTA MEDICINE, 2642 University Avenue, St. Paul 14, Minnesota. Only the facts are needed—who? what? where? when? why?—since items can be rewritten for uniformity of style.

* * *

Dr. **Richard L. Conde**, formerly of Duluth, has been named clinical director of the Anoka State Hospital, Anoka. He will serve as assistant to **Dr. George L. Wadsworth**, superintendent of the hospital. Dr. Conde recently completed two years on the staff of Walter Reed Hospital in Washington, D. C., and formerly served a year at the Rochester State Hospital.

* * *

Dr. **C. Walton Lillehei**, University of Minnesota, was the principal speaker at a luncheon meeting of Minnesota Heart Association campaign chairmen at the University of Minnesota in mid-July.

* * *

Recently elected medical director of the Iron Range Rehabilitation Center in Virginia was **Dr. McLemore Bouchelle**, a member of the East Range Clinic. He succeeds **Dr. W. S. Neff**, who held the position last year.

* * *

Dr. **Raymond J. Gully**, superintendent of the state hospital at Cambridge, has resigned to accept a position at the Veterans Administration Hospital at Ft. Meade, S. D. Dr. Gully entered state service in 1930 as a staff physician at St. Peter State Hospital. He became superintendent at Cambridge in 1950.

* * *

A dinner party to honor **Dr. Edgar J. Huenekens** for his long service to pediatrics and the Minneapolis community is being planned for the evening of September 27 at the Calhoun Beach Hotel, Minneapolis. The date is expected to be particularly convenient since it is the evening before the Northwestern Pediatric Society fall meeting at Bayport.

* * *

Dr. **Ancel Keys**, University of Minnesota, and three other American scientists accompanied **Dr. Paul Dudley White**, President Eisenhower's heart specialist, on a tour of Russia early in September. They were invited by the Soviet Ministry of Health and made the trip with State Department approval. Dr. Keys and Dr. White have made similar studies of cardiac problems in Italy and Japan.

* * *

Dr. **Kenneth R. Larson**, St. Paul, is the man behind a new business in St. Paul called American Geriatric Enterprises (AGE), designed to provide employment for able-bodied men in the fifty to sixty-five age bracket. Learning how difficult it was for such men to find jobs, Dr. Larson formed a committee last December to study the situation with the help of the Minnesota Division of Security and Unemployment. The result is the newly incorporated business called AGE, a firm that handles jobs on a contract and subcontract basis and expects to employ more than twenty-five carefully selected men from the higher age brackets by the end of this year.

* * *

A brief biographical sketch of **Dr. Harold F. Buchstein** appeared in the Town Toppers column of the *Minneapolis Star* on July 20. A consultant in neurosurgery for General Hospital, Minneapolis, Dr. Buchstein is currently engaged in raising money for the United Hospital Fund.

* * *

Dr. **Clayton E. J. Nelson**, Albert Lea, was elected president of the school board in Albert Lea at a meeting in mid-July. He has been a member of the board for one year.

* * *

Dr. **Thomas J. Dry** and his family left Rochester on July 15 for Capetown, South Africa, where Dr. Dry has entered the private practice of medicine as a consulting physician. He had been a member of the staff of the Mayo Clinic since 1936, after receiving his education and practicing medicine briefly in Capetown.

* * *

New president of the Minnesota Heart Association is **Dr. Robert L. Parker**, Rochester, who was elected at a meeting of the organization in St. Paul in mid-July. He had been serving as acting president since April. Other officers elected included **Dr. Milton Hurwitz**, St. Paul, vice president, and **Dr. Karl Anderson**, Minneapolis, secretary.

* * *

A research grant of $43,100 has been awarded the American College of Physicians for the coming year by the Department of Health, Education and Welfare of the Public Health Service, to further a project to evaluate internal medicine in hospitals. Director of the study is **Dr. Marion A. Blankenhorn**, Cincinnati. A pilot study of 100 hospitals is being conducted by sending physicians to observe and evaluate methods of practice, with particular reference to internal medicine. Although appraisal of medical care provided in hospitals is the primary objective of the study, information on internships and residencies is also being gathered.

Close liaison is being maintained with the AMA Council on Medical Education and Hospitals and committees of the Association of American Medical Colleges. It is expected that findings in the study may lead to revisions in the internal medicine policies of the council and committees.

* * *

Dr. **W. McK. Craig**, Rochester, has been elected president of the Mayo Foundation Chapter of Sigma Xi. Other new officers include **Dr. H. L. Mason**, vice president, and **Dr. K. N. Ogle**, secretary-treasurer.

(Continued on Page A-40)

Announcing

The Twenty-Fourth Annual Assembly

OF THE

OMAHA MID-WEST CLINICAL SOCIETY

Sheraton-Fontenelle Hotel, Omaha, Nebrahka

OCTOBER 29TH THRU NOVEMBER 1ST, 1956

FEATURING 11 GUEST SPEAKERS OF NATIONAL REPUTE

Charles C. Dennie, M.D., Dermatology
University of Kansas Medical Center

C. Paul Hodgkinson, M.D., Gynecology and Obstetrics
Henry Ford Hospital, Detroit, Michigan

George C. Griffith, M.D., Internal Medicine
University of Southern California School of Medicine

Chester S. Keefer, M.D., Internal Medicine
Boston University School of Medicine

Hugh T. Carmichael, M.D., Neuropsychiatry
University of Illinois College of Medicine

Jack Wickstrom, M.D., Orthopedic Surgery
Tulane University of Louisiana School of Medicine

Merrill J. Reeh, M.D., Ophthalmology
Portland, Oregon

James L. Wilson, M.D., Pediatrics
University of Michigan Medical School

Henry G. Moehring, M.D., Radiology
Duluth Clinic, Duluth, Minnesota

Denton A. Cooley, M.D., Surgery
Baylor University College of Medicine

Thomas B. Quigley, M.D., Surgery
Harvard Medical School

Lectures, panel discussions, round-table luncheons and dinners, medical motion pictures, scientific and technical exhibits.

Approved for Category I credit by the American Academy of General Practice

Registration fee — $7.50.

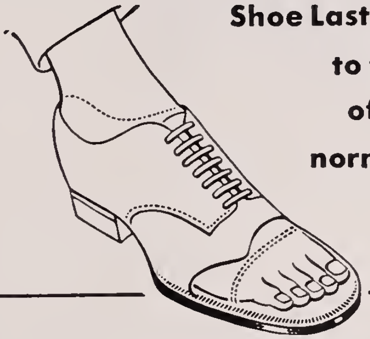
For information write . . .

JAMES J. O'NEIL, M.D., Director of Clinics
1031 Medical Arts Building, Omaha, Nebraska

organomercurial diuretics "...permit ingestion of enough salt to make food palatable; without them, many patients would lose their appetites, a consequence of the salt-free diet which has occasionally been known to cause serious malnutrition."✻

✻Modell, W.: The Relief of Symptoms, Philadelphia, W. B. Saunders Company, 1955, pp. 265-266.

03156



Shoe Last designed to the shape of average normal foot★

- Insole extension and wedge at inner corner of heel where support is most needed.
- The patented arch support construction is guaranteed not to break down.
- Innersoles guaranteed not to crack or collapse.

★ Foot-so-Port lasts designed and the shoe construction engineered with orthopedic advice.

- Conductive Shoes for surgical and operating room personnel. N.B.F.U. specifications.
- We are also the manufacturer of the Gear-Action Shoe designed by noted orthopedic surgeon.
- We make more shoes for polio, club feet and disabled feet than any other shoe manufacturer.

Send for free booklet, "The Preservation of the Function of the Foot Balancing and Synchronizing the Shoe with the Foot."

Write for details or contact your local **FOOT-SO-PORT** *Shoe Agency. Refer to your Classified Directory*

Foot-so-Port Shoe Company, Oconomowoc, Wis.
A Division of Musebeck Shoe Company

an arm chair little patients will really like . . .

P&H

Designed primarily for the doctor's office . . . it is made to seat your child patients. An extremely popular design with superior frame construction. The 1" steel tubing is triple plated with copper, nickel and chrome. The legs are equipped with furniture glides. The seat and back are well padded and covered with red Naugahyde. Overall height is 22", width 14". Write for price . . . MM-956.

Physicians & Hospitals Supply Co.

1400 Harmon Place Minneapolis 3, Minn.

(Continued from Page A-38)

Dr. Frank H. Krusen, Rochester, presided at the meeting of the International Federation of Physical Medicine in Copenhagen, Denmark, in August. Dr. Krusen is president of the organization.

* * *

Ten Minnesota physicians will receive grants totaling $54,940 for heart research under a joint program of the Minnesota and American Heart Associations.

The grants go to Drs. **Ellis S. Benson, Henry M. Cavert, Richard A. DeWall, Robert A. Good, Ancel Keys, Richard T. Smith, Henry L. Taylor, Louis Tobian,** and **Richard VonKorff,** all of the University of Minnesota, and **R. David Nelson** of Bethel College.

* * *

Physicians who employ laboratory aides will be interested to know that twenty students are receiving certificates from the University of Minnesota on September 22. These students have satisfactorily completed the course for laboratory aides offered through the General Extension Division of the University. They are trained to do hemoglobin determinations, white blood cell counts, red blood cell counts, normal differential smears and recognition of an abnormal smear, routine urinalysis, titration of gastric acidity, BMR tests, EKG tests, blood group typing and limited blood chemistry determination (sugar, urea nitrogen, chloride). The students are best qualified to work in a doctor's office or to assist a registered medical technologist in a hospital or clinic laboratory.

Information about the students and the training program may be obtained from **Verna Rausch,** assistant professor of medical technology, C205 Mayo Building, University of Minnesota, Minneapolis 14, Minnesota.

* * *

Dr. Lester L. Bissinger has joined the Brainerd Clinic, Brainerd, as general surgeon with **Dr. G. I. Badeaux** and **Dr. Maurice Meller.**

* * *

Dr. Albert Faulconer of the Mayo Clinic, Rochester, has agreed to serve as associate editor of *Survey of Anesthesiology,* a new journal scheduled for publication in February, 1957.

The bimonthly journal is edited by Dr. C. Ronald Stephen, professor of anesthesiology at Duke University, and will consist of digests of important articles in anesthesiology, physiology, pharmacology and biochemistry. The articles selected are to be chosen from hundreds of foreign and domestic journals, and each article will be evaluated by an editorial comment at the end of the article.

Survey of Anesthesiology will be published by the Williams & Wilkins Company of Baltimore. The subscription price is $10.00.

* * *

NEW LOCATIONS

Dr. Jack V. Wallinga has returned from a period of service in the Navy and has opened offices at 215 Doctors Building, Minneapolis, with his practice limited to child psychiatry.

Dr. Garth W. Englund, who recently completed his internship at Denver General Hospital, Denver, Colorado, has taken over the practice of **Dr. G. R. Peterson** at Mabel. Dr. Peterson is taking postgraduate work in orthopedics.

* * *

Dr. James E. Fearing, recently of Chicago, has become associated in practice with **Dr. F. C. Closuit** in Aitkin.

* * *

Dr. William A. Chervenak, following completion of his internship at Letterman General Hospital, San Francisco, has joined the staff of the Mesaba Clinic at Chisholm.

* * *

Dr. S. B. Spieler, formerly of Lincoln, Nebraska, has opened offices for the practice of medicine at Pequot Lakes.

* * *

Dr. Owen W. Holm, who recently completed his internship at Ancker Hospital, St. Paul, has begun practice in the Browerville Clinic, Browerville, in association with **Dr. A. J. Lenarz.** He replaces **Dr. William Byrne,** who has moved to California.

* * *

Dr. John Holten, formerly of Grand Forks, North Dakota, has joined the staff of the Raiter Hospital and Clinic at Cloquet.

* * *

Dr. Charles H. Nelson, formerly of Minneapolis, has joined the staff of the Surgical and Medical Clinic at Albert Lea.

* * *

Dr. Daniel Degallier, formerly of Switzerland and a resident of the United States since 1950, has become associated in practice with **Dr. D. V. Boardman** at Winona.

* * *

Dr. Robert Schulz, following completion of his internship at St. Luke's Hospital, Duluth, has become associated in practice with **Dr. E. E. Zemke** at Fairmont.

* * *

Dr. Richard Swenson and **Dr. Kenneth Knutson** have joined the staff of the Mesaba Clinic and are practicing at Keewatin and Coleraine. Dr. Swenson is formerly of Minneapolis, and Dr. Knutson of Rapid City, South Dakota.

* * *

Dr. Denis V. Campbell, recently of the Cleveland Clinic, has become associated in radiological practice with **Dr. Ward Shaver** in Fergus Falls.

* * *

Dr. Douglass Perkins, following a period of service in the Air Force, has rejoined the staff of the Alexandria Clinic, Alexandria.

* * *

Dr. Burton Sandberg, who recently completed his internship at St. Luke's Hospital, Duluth, has joined the East Range Clinic at Aurora.

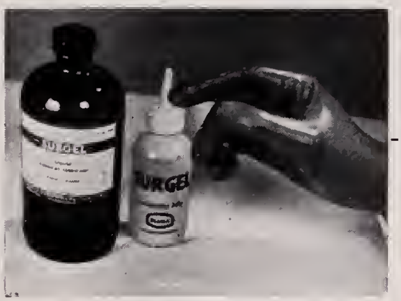
* * *

Dr. Calvin J. Johnson, from the University of Iowa Hospital, has joined the surgery staff of the Grand Rapids Clinic, Grand Rapids.

slash lubricating costs . . .

USE

SURGEL LIQUID



AN
ULMER
PRODUCT

SURGEL LIQUID cuts costs of lubricating jelly materially. No waste often encountered with tube preparations occurs. Every drop can be used. Free-flowing, esthetic in appearance, SURGEL LIQUID will not clog the dispenser tip. A very small amount lubricates a large area.

SURGEL LIQUID is sterile, too. Each batch is autoclaved and a special "built-in" disinfectant wards of contamination.

A true "money-saver," SURGEL LIQUID is the choice of hospitals, clinics and physicians' offices. Write for your trial supply . . .MM-956.

Supplied in pints with special dispenser . . . also gallons.

Physicians & Hospitals Supply Co.

1400 Harmon Place • Minneapolis 3, Minn.

APH
OMAHA
APC
OMAHA

the Emblems of RELIABLE PROTECTION

We cordially invite your inquiry
for application for membership
which affords protection against
loss of income from accident and
sickness as well as benefits for
hospital expenses for you and
all your dependents.

ALL PREMIUMS COME FROM
PHYSICIANS SURGEONS DENTISTS
ALL BENEFITS GO TO

$4.500.000 ASSETS
$23.800.000 PAID FOR BENEFITS
SINCE ORGANIZATION

Since 1902

**PHYSICIANS CASUALTY
AND
HEALTH ASSOCIATIONS
OMAHA 2, NEBRASKA**

GENERAL INTEREST

Dr. Robert Vaaler, after completing his internship at a Dallas, Texas, hospital, has become associated in practice with **Dr. Theodore Greenfield** in Cokato.

* * *

Dr. Norman B. Ordahl, after completing a surgical residency at the VA Hospital in Boston, has become associated in practice with **Dr. D. V. Boardman** in Winona.

MINNESOTA BLUE SHIELD-BLUE CROSS

Minnesota Blue Shield payments to doctors during the first six months of 1956 exceeded by more than one-half million dollars the amount paid during the first half of 1955 for physicians' services to participant subscribers. During the first six months of 1956 Blue Shield paid $3,337,492 for subscribers' medical-surgical-obstetrical care compared with $2,837,170 paid during the first six months of 1955. Blue Shield allowances during the first half of 1956 represent a monthly average payment of $556,248, and at no other time in Blue Shield's history have total payments for a similar period equaled the amount paid from January first through June of 1956.

The number of doctors' services for which benefits were provided during the first six months of 1956 is 116,716, or 21,931 more than the number of services which were paid by Blue Shield during the first half of 1955. These figures, too, represent a record for the number of doctors' services paid in any six months period by Minnesota Blue Shield.

Enrollment in Minnesota Blue Shield as of June 30, 1956, was 767,770 participant subscribers, which figure represents 24 per cent of the total population of the state and is 76,364 greater than the number of subscribers enrolled as of June 30, 1955, and 38,308 more than were enrolled as of December 31, 1955.

The number of Minnesotans covered by Blue Cross as of June, 1956, totaled 1,052,272 as compared to 1,006,117 as of June, 1955; an increase of 46,155 participant subscribers, according to Arthur M. Calvin, President of Minnesota Hospital Service Association.

Statistics just released reveal that during the first six months of 1956, approximately 562,000 days of hospital care were provided for 91,450 Blue Cross subscribers. This represented an increase of 43,000 days and 7,658 cases over the same period of the preceding year.

This increase reflects an increase in both the number of Blue Cross subscribers and an increase in usage of Blue Cross coverage.

Increases in the number of respiratory illness per 1,000 persons protected is the major reason for the increased usage in comparing the first six months of 1956 to the same period of 1955.

Payments to hospitals for the first six months of 1956 totaled more than $10,500,000, for a monthly average payment of $1,750,000 as compared to hospital payments during the first six months of 1955 at slightly less than $9,000,000, for a monthly average payment of $1,500,000. The increased hospital payments can be attributed to increased participant subscriber usage and the increase in range of benefits now being provided to Blue Cross subscribers and their families.

Book Reviews

Books listed here become the property of the Ramsey, Hennepin and St. Louis County Medical Libraries when reviewed. Members, however, are urged to write reviews of any or every recent book which may be of interest to physicians.

THE SCALP IN HEALTH AND DISEASE. By Howard T. Behrman, A.B., M.D., Assistant Clinical Professor of Dermatology, New York University Post-Graduate Medical School; Fellow, American Academy of Dermatology; Diplomate, American Board of Dermatology. 566 p. Illus. Cost $12.75. St. Louis: C. V. Mosby Co., 1952.

The need for a comprehensive and detailed study of the scalp is found in Dr. Behrman's book, "The Scalp in Health and Disease." As Dr. Sulzberger wrote in the preface, there is bound to be honest difference in opinion in reference to various statements made by the author and those believed by himself, and I might add particularly with other dermatologists, but the general overall picture is encyclopedic in its scope and coverage. The text itself is written in a very readable manner, but without compromise to its scientific accuracy. The book is well organized and extremely well illustrated with photomicrographs, photographs, and, when these are not feasible, by drawings. The common, as well as the rare, conditions of the scalp are discussed, as are the normal and the pathological with no preponderance of one subject and a "sloughing off" of another. In the Appendix of the book is an extensive Formulary which should be of value to the general physicians as well as to the specialist. References at the end of each chapter are complete and well organized covering a given subject or condition.

This text constitutes a "job well done" and is a "must" as a comprehensive reference for a subject that is too poorly understood by all who deal with treatment of the scalp.

Irvine M. Karon, M.D.

FILMS ADDED TO AMA LIBRARY

Three films were added recently to the AMA Motion Picture Library for use by state and county medical societies.

1. "Alcohol and the Human Body" portrays the course that ethyl alcohol takes when it enters the human body in the form of beverages. Animated drawings show the absorption of the alcohol from the stomach and small intestine, the partial change to acetic acid in the liver, the circulation of the unchanged fraction in the blood, and the gradual depression of successive parts of the brain. Black and white; ten minutes.
2. "Heart Disease—Its Major Causes" consists of pictures of patients to illustrate the various situations that arise out of heart disease. Animated diagrams illustrate the underlying changes in the heart. This film presents an over-all view of heart disease and concentrates on high blood pressure, hardening of the arteries and rheumatic fever. Black and white; ten minutes.
3. "Tobacco and the Human Body" analyzes the contents of tobacco smoke, demonstrates some of the physiological effects of smoking and sums up the factors to be considered in deciding whether or not to smoke. Black and white; fifteen minutes.

Further information on any of these films may be obtained from the AMA Motion Picture Library.

EVERY WOMAN

WHO SUFFERS

IN THE

MENOPAUSE

DESERVES

"PREMARIN"®

widely used

natural, oral

estrogen

AYERST LABORATORIES

New York, N. Y. • Montreal, Canada

5645

GYNECOLOGIC CYTOLOGY SERVICE
Interpretation of Cervico-Vaginal, Etc.
(Papanicolaou) Smears
for the
Diagnosis of Carcinoma
Kits (Slides, Spatulas, Fixative and Mailing Containers)
and
Instructions for Taking and Mailing Smears furnished on request
M. WM. RUBENSTEIN, M.D.
GYNE-CYTOLOGY LABORATORY
636 Church Street, Room 517 Evanston, Illinois

GLYCAMINE®
TABLETS
For Peptic Ulcers and Hyperacidity
Available All Drug Stores
Distributed by
DALCO PHARMACAL CO.
Minneapolis, Minnesota

ARTIFICIAL LIMBS
ORTHOPEDIC APPLIANCES
TRUSSES
SUPPORTERS
ELASTIC HOSIERY

FREJKA
Abduction Pillow Splint
by the
Original Maker
For displasia of the hip in the newborn and in early postnatal life (as described by Dr. V. L. Hart, Journal of Bone and Joint Surgery, Vol. 31-A, pp 357-372, April, 1949)
Prompt, painstaking service
BUCHSTEIN-MEDCALF CO.
223 So. 6th Street Minneapolis 2, Minn.

RADIUM
(Including Radium Applicators)
FOR ALL MEDICAL PURPOSES
Est. 1919
Quincy X-Ray and Radium Laboratories
(Owned and Directed by a Physician-Radiologist)
HAROLD SWANBERG, B.S., M.D.
Director
W. C. U. Bldg. Quincy, Illinois

Safe As America
U. S. SAVINGS BONDS
For your own security – and for America's – invest in Savings Bonds regularly – and hold on to them!

DANIELSON MEDICAL ARTS PHARMACY, INC.
PHONES:
FEderal 3-3317
FEderal 3-3318
10-14 Arcade, Medical Arts Building
825 Nicollet Avenue—Two Entrances—78 South Ninth Street
MINNEAPOLIS
HOURS:
WEEK DAYS—8 to 7
SUN. & HOL.—10 to 1

Insurance at a Saving
Druggists' Mutual Insurance Company
OF IOWA, ALGONA, IOWA
Fire - Tornado - Automobile Insurance
Prompt Loss Service
MINNESOTA REPRESENTATIVE—S. E. STRUBLE, WYOMING, MINN.

Malpractice Prophylaxis

With us
1955 brought less than half as
many malpractice claims and
suits as were filed against
fewer policyholders
twenty years ago

Specialized Service makes our doctor safer

THE
MEDICAL PROTECTIVE COMPANY
FORT WAYNE, INDIANA

Professional Protection Exclusively
since 1899

MINNEAPOLIS Office:
Robert L. McFerran, Rep.
311 East 24th St., Apt. A-1
Telephone Federal 9-1292

"...in patients with moderately severe and severe cardiac failure, neohydrin is the oral diuretic of choice."*

*Moyer, J. H., and others:
J. Chronic Dis. 2:670, 1955.

03056

THE BANK
WHERE YOU
FEEL AT
HOME

the AMERICAN
NATIONAL BANK OF SAINT PAUL
MEMBER FEDERAL DEPOSIT INSURANCE CORPORATION

NEW!
Patented HANSEN
Split Frame Truss

Positive Hernia Control

Contoured Spring Design Gives
Custom Made Comfort
Unlimited Body Activity

Single with Dummy illustrated
Double not illustrated

C. F. ANDERSON CO., INC.

901 Marquette
Minneapolis, Minnesota

RADIUM RENTAL SERVICE
4340 CEDARWOOD ROAD
MINNEAPOLIS 5, MINNESOTA
TEL. FE 3-5297

Radium element prepared in type of applicator requested

ORDER BY TELEPHONE OR MAIL
PRICES ON REQUEST

Classified Advertising

Replies to advertisements with key numbers should be mailed in care of MINNESOTA MEDICINE *2642 University Avenue, Saint Paul 14, Minnesota.*

PHYSICIAN NEEDED—In county seat town of 1800, located in excellent farming community, Central Minnesota. No other physician within 35-mile radius. New 25-bed hospital planned. Good schools and housing. Office available. Address Kenneth Mattson, Mahnomen, Minnesota.

PHYSICIAN WANTED—Community of 4,000 needs physician and surgeon; resort area; new Clinic building just completed and future hospital assured; living quarters available. Write Secretary, Kelliher Hospital, Kelliher, Minnesota.

DOCTOR URGENTLY NEEDED in Le Center, Minnesota. Fully equipped new office, new home, available in beautiful, prosperous community 60 miles from Twin Cities. Previous man left to specialize. Call, write or see Miles Bowler, Mayor, Le Center, Minnesota.

WANTED—General practitioner for State Hospital. Salary range $641 to $781 per month. Quarters available, subsistence, laundry, and garage. Government working conditions, paid holidays, vacation, sick leave, and retirement pension plan. Write Superintendent, Fergus Falls State Hospital, Fergus Falls, Minnesota.

PHYSICIAN WANTED—Young, general practitioner interested in obstetrics and pediatrics, to join three-man suburban group in new building. Address E-543, care MINNESOTA MEDICINE.

FOR SALE—Complete office equipment, also portable 15 ma x-ray, BMR, nearly new autoclave, ECG. Excellent condition, reasonable. Address E-541, Care MINNESOTA MEDICINE.

LOCUM TENENS—Physician wanted until July, 1957, Northwestern Minnesota. Lucrative general and surgical practice. Equipped office near community hospital available on rental basis. Immediate income. Possible purchase or association later. Address E-544, care MINNESOTA MEDICINE.

SURGEON, 33, qualified for Boards and with good practical experience in general and industrial surgery, also orthopedic and thoracic surgery, desires location either with busy surgeon or in location offering opportunity to develop a practice. Address E-545, care MINNESOTA MEDICINE.

WANTED—Locum tenens in general practice, Saint Paul. Someone awaiting fellowship in medicine or obstetrics especially desirable. Six months minimum. Address E-546, care MINNESOTA MEDICINE.

WANTED—Christian doctor with surgical training and experience to associate with doctor in general practice in town of approximately 1,500 population and large rural territory; new up-to-date hospital. Write E-547, care MINNESOTA MEDICINE.

STAFF VACANCY—Physician required as of September 15 for Student Health Service, State College of Washington, located at Pullman, 75 miles south of Spokane. Beginning salary—9-month basis, $8,000; 11-month basis, $9,500 (slight increase for exceptional experience or training). Washington license required. Reciprocity with Minnesota and other states. Clinic hours—9 to 12 a.m. and 1 to 5 p.m., weekdays; Saturday a.m. only. Emergencies, after hours, weekends and holidays handled "on call." College enrollment about 5,500 students. Excellent school and cultural opportunities. Housing available through College Housing Office. Address H. E. Zion, M.D., Director of Student Health, State College of Washington, Pullman, Washington.

POSITION WANTED—Receptionist and clerical worker in doctor's office. Experienced clerk-typist and nurse aid. Address E-548, care MINNESOTA MEDICINE.

DOCTOR OR DENTIST—Beautiful suite in South Minneapolis. Very modern. Six months free rent. Then option of lease at very reasonable rent. Wm. L. Cochrane, 4101 - 42nd Avenue South, Minneapolis, Minnesota. Telephone Ro 9-8758.

FOR RENT—Highland Shopping Area, equipped office available, full or part time. Share with surgeon and dentist. Excellent for general practice, obstetrics, pediatrics. No equipment necessary; no rent until established. H. Schwyzer, M.D., 2069 Ford Parkway, Saint Paul. Telephone: MI 8-4832 or CA 4-7416.

ATTENTION DENTISTS AND DOCTORS—Modern space available for dentists' and doctors' offices. A location where several sets of doctors and dentists have been long established and then built their own clinics. A money maker. Above Kisch's Food Market. Plenty of auto parking space. Apply 637 Stryker Avenue, Saint Paul, Minnesota.

FOR RENT OR SALE—Eight-room, first-floor physician's office. Well equipped. Near Twin Cities. Gross over $30,000. New hospital—unlimited privileges. Good opportunity. Write E-511, care MINNESOTA MEDICINE.

FOR SALE—Used General Electric, 100 milliampere x-ray machine, good as new. Model R-2-39, Serial Number 288395. Completely dismantled. Ready for shipment anywhere. Interested buyer can be assured of good deal. Write or call Grand Rapids Clinic, 504 First Avenue N.W., Grand Rapids, Minnesota. Telephone FAirview 6-3436.

FOR RENT—Suite of seven rooms, especially designed for physician's use located at 2723 East 38th Street, Minneapolis. Occupied by M.D. past eleven years. Write or call H. A. Lindberg, 3925 28th Avenue South, Minneapolis 6, PArkway 2-0002.

The Birches Sanitarium, Inc.

2391 Woodland Avenue
Duluth 3, Minnesota

A hospital for the care and treatment of Nervous and Mental disorders. Quiet, cheerful environment. Specially trained personnel. Recreational and occupational therapy.

Dr. L. R. Gowan, M.D., M.S., Medical Director

Index to Advertisers

Abbott Laboratories A-8, A-9
Aloe, A. S., Co. A-32
American Meat Institute A-6
American National Bank of Saint Paul A-45
Anderson, C. F., Co., Inc. A-45
Ayerst Laboratories A-43

Baker Laboratories, Inc. A-14
Bayer Co. A-10
Birches Sanitarium A-47
Breon, Geo. A., & Co. A-12
Brown & Day, Inc. A-48
Buchstein-Medcalf Co. A-44
Burroughs Wellcome & Co. ....A-5, A-13, Cover III

Caswell-Ross Agency 588-A
Ciba A-48
Classified Advertising A-46
Cook County Graduate School of Medicine A-48

Dalco Pharmacal Co. A-44
Danielson Medical Arts Pharmacy, Inc. A-44
Druggists Mutual Insurance Co. A-44

Foot-so-Port Shoe Co. A-39

Geigy Pharmaceuticals A-29
Gyne-Cytology Laboratory A-44

Hoffmann-La Roche, Inc. ....Insert facing page A-28

Juran & Moody, Inc. A-16

Knox, Chas. B., Gelatine Co., Inc. 588-D

Lakeside Laboratories A-31, A-39, A-45
Lederle Laboratories A-11, 588-B, 588-C
Lilly, Eli, & Co. ....Cover I, A-36

Medical Protective Co. A-45
Merck Sharp & Dohme A-24, A-25

Omaha Mid-West Clinical Society A-39

Parke, Davis & Co. ....Cover II, A-1
Pfizer Laboratories A-17
Physicians Casualty Association A-42
Physicians & Hospitals Supply Co. A-40, A-41
Professional Credit Protective Bureau A-4
Professional Suite A-30

Quincy X-Ray & Radium Laboratories A-44

Radium Rental Service A-45

St. Paul Fire & Marine Insurance Co. A-28
St. Croixdale Sanitarium A-28
Schering Corporation ....Insert facing page A-4, A-20, Insert facing page A-20, A-34, A-35
Searle, G. D., & Co. A-37
Smith, Kline & French Laboratories ....Cover IV
Squibb A-26
Sutliff & Case Co., Inc. A-30

U. S. Vitamin Corporation A-21
Upjohn A-27

Viceroy Cigarettes A-18

Wallace Laboratories A-15
Winthrop Laboratories A-22, A-32
Wyeth A-7, A-19, A-23, A-33

Brown & Day, Inc.

WE STOCK and CAREFULLY FIT:

SUPPORTS
- sacro-iliac
- lumbosacral
- dorsolumbar
- obesity
- maternity
- visceroptosis
- wrist and ankle
- rib
- surgical
- brassieres

ELASTIC HOSIERY
- surgical
- service
- sheer

APPLIANCES
- colostomy
- ileostomy
- nephrostomy
- urinal

BRACES
- taylor
- chair-back
- goldthwait
- cervical

MASTECTOMY PROSTHESES
TRUSSES—TRACTION APPARATUS

Comfortable Private Fitting Rooms

"Everything for the Physician"

for fast service call CA 2-1845

BROWN & DAY INC. SAINT PAUL U.S.A. SERVICE QUALITY

62-64 EAST 5TH ST
St. Paul 1, Minn

Cook County Graduate School of Medicine

INTENSIVE POSTGRADUATE COURSES
STARTING DATES—SUMMER AND FALL, 1956

SURGERY—Surgical Technic, two weeks, October 29, November 26
Surgical Anatomy and Clinical Surgery, two weeks, October 1
Surgery of Colon and Rectum, one week, October 15
General Surgery, one week, October 22
Thoracic Surgery, one week, October 1
Esophageal Surgery, one week, September 24
Breast and Thyroid Surgery, one week, October 22
Gallbladder Surgery, three days, October 29
Fractures and Traumatic Surgery, two weeks, October 15

GYNECOLOGY AND OBSTETRICS—Obstetrics and Gynecology, three weeks, October 22
Vaginal Approach to Pelvic Surgery, one week, October 15

MEDICINE—Electrocardiography and Heart Disease, two-week basic course, October 8; one week advanced course, September 17
Internal Medicine, two weeks, September 24
Gastroenterology, two weeks, October 22
Dermatology, two weeks, October 15
Cardiology (Pediatric), two weeks, November 5

RADIOLOGY—Diagnostic X-ray, two weeks, November 26
Clinical Uses of Radioisotopes, two weeks, October 8

UROLOGY—Two-week course, October 8
Cystoscopy, ten days, by appointment

TEACHING FACULTY—ATTENDING
STAFF OF COOK COUNTY HOSPITAL

ADDRESS: REGISTRAR, 707 South Wood Street,
Chicago 12, Illinois

for a spastic
GUT

Trasentine®-Phenobarbital

integrated relief . . .
mild sedation
visceral spasmolysis
mucosal analgesia

TABLETS *(yellow, coated), each containing 50 mg. Trasentine® hydrochloride (adiphenine hydrochloride CIBA) and 20 mg. phenobarbital.*

C I B A
Summit, N. J.

2/2228M

WHY SENSITIZE

in topical and ophthalmic infections

USE 'POLYSPORIN'®

brand

POLYMYXIN B—BACITRACIN OINTMENT

to insure broad-spectrum therapy with minimum allergenicity

For topical use: in ½ oz. and 1 oz. tubes.
For ophthalmic use: in ⅛ oz. tubes.

BURROUGHS WELLCOME & CO. (U.S.A.) INC., Tuckahoe, N. Y.

"... a highly effective antiemetic
and is safe for use in children."[1]

THORAZINE* *chlorpromazine, S.K.F.*

The safety and effectiveness of 'Thorazine' for control of vomiting in children has been confirmed by a number of clinicians.

Results in refractory cases have been particularly dramatic.[1-5]

'Thorazine' is available in ampuls, tablets and syrup (as the hydrochloride), and in suppositories (as the base).

'Thorazine' should be administered discriminately; and, before prescribing, the physician should be fully conversant with the available literature.

Pediatric Bibliography

1. Wikler: The Use of Chlorpromazine as an Anti-emetic in Children, Arch. Pediat. *72*:197 (June) 1955.
2. Daeschner et al.: Chlorpromazine in the Control of Vomiting in Children, Am. J. Dis. Child. *89*:525 (May) 1955.
3. Steigman and Vallbona: Chlorpromazine, A Useful Antiemetic in Pediatric Practice, J. Pediat. *46*:296 (March) 1955.
4. Steigman and Vallbona: Experience with Chlorpromazine in Pediatrics, Internat. Rec. Med. & Gen. Pract. Clinics *168*:351 (May) 1955.
5. Moyer et al.: Clinical Studies of an Anti-emetic Agent, Chlorpromazine, Am. J. M. Sc. *228*:174 (Aug.) 1954.

*T.M. Reg. U.S. Pat. Off.

Smith, Kline & French Laboratories, Philadelphia

COLLEGE OF PHYSICIANS
LIBRARY
MAR - 6 1957
OF PHILADELPHIA

Minnesota MEDICINE

Published Monthly by the Minnesota State Medical Association

Volume 39 OCTOBER, 1956 Number 10

Printed in U.S.A. (Table of Contents—Pages A-2 and A-3) 40c a copy—$3.00 a year

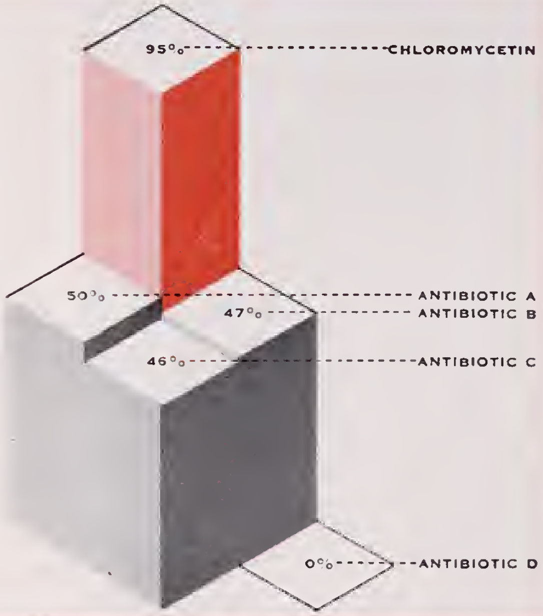
Infections of the respiratory tract respond readily to

ILOTYCIN
(ERYTHROMYCIN, LILLY)

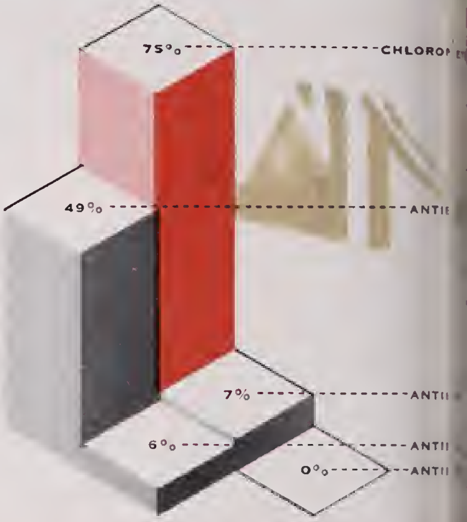
safe, well tolerated

Lilly
QUALITY / RESEARCH / INTEGRITY

SENSITIVITY OF COMMON PATHOGENS TO CHLOROMYCETIN AND FOUR OTHER MAJOR ANTIBIOTIC AGENTS*

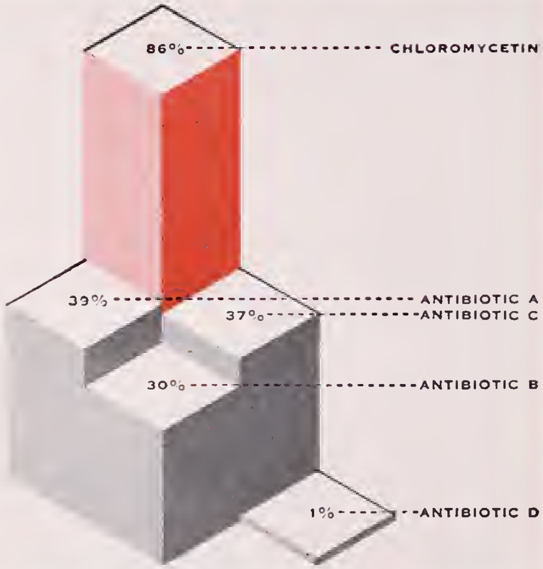


ESCHERICHIA COLI
(148-227 STRAINS)

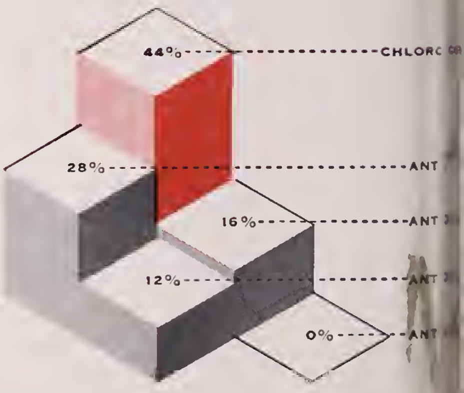


BACILLUS PROTEUS
(63-104 STRAINS)

AEROBACTER AEROGENES
(143-248 STRAINS)



PSEUDOMONAS AERUGINOSA
(39-70 STRAINS)



*This graph, based on *in*
is adapted from Horton a

when more than one organism is involved...

Chloromycetin®

for today's problem pathogens

Therapeutic advantages of CHLOROMYCETIN (chloramphenicol, Parke-Davis) are especially appreciated when mixed infections are encountered because it provides highly effective antibiotic action both against gram-negative and against gram-positive pathogens.[1-7] CHLOROMYCETIN also acts against many pathogens which may grow when originally sensitive organisms have been suppressed.[2]

Unlike some antibacterial agents which are specific for one type of organism only, or others to which bacterial resistance readily develops, CHLOROMYCETIN demonstrates continued efficacy against a wide variety of commonly occurring microorganisms: "Sensitivity of many strains of pathogens to chloramphenicol [CHLOROMYCETIN] and limited tendency of these organisms to develop resistance to this antibiotic explain the effectiveness of chloramphenicol where other antibiotics and chemotherapeutic agents have failed."[1]

CHLOROMYCETIN is a potent therapeutic agent, and because certain blood dyscrasias have been associated with its administration, it should not be used indiscriminately or for minor infections. Furthermore, as with certain other drugs, adequate blood studies should be made when the patient requires prolonged or intermittent therapy.

References: (1) Felix, N. S.: *Pediat. Clin. North America* 3:317, 1956. (2) Joron, G. E.; Fowler, A. F.; de Vries, J.; Reid, G., & Mathews, W. H.: *Canad. M. A. J.* 73:956, 1955. (3) Weil, A. J., & Stempel, B.: *Antibiotic Med.* 1:319, 1955. (4) Perry, R. E., Jr.: *North Carolina M. J.* 16:567, 1955. (5) Jones, C. P.; Carter, B.; Thomas, W. L., & Creadick, R. N.: *Obst. & Gynec.* 5:365, 1955. (6) Murphy, F. D., & Waisbren, B. A., in Murphy, F. D.: Medical Emergencies: Diagnosis and Treatment, ed. 5, Philadelphia, F. A. Davis Company, 1955, p. 557. (7) Altemeier, W. A.; Culbertson, W. R.; Sherman, R.; Cole, W.; Elstun, W., & Fultz, C. T.: *J.A.M.A.* 157:305, 1955. (8) Horton, B. F., & Knight, V.: *J. Tennessee M. A.* 48:367, 1955.

MEDICAMENTA VERA · PD CO.

PARKE, DAVIS & COMPANY
DETROIT 32, MICHIGAN

60024

Volume 39
Number 10

Minnesot

Contents fo

SCIENTIFIC ARTICLES

ORIGINAL CONTRIBUTIONS

The Patient Who Won't Get Well
Donald W. Hastings, M.D., Minneapolis, Minnesota.... 635

Reconstruction of Major Blood Vessels Employing Artery Homografts
Frederick M. Owens, Jr., M.D., Saint Paul, Minnesota 638

The Changing Character of Infections as the Result of the Era of Chemotherapy
F. H. Top, M.D., Iowa City, Iowa.............................. 642

Congenital Obstruction of the Small Intestine and Colon
B. G. Lannin, M.D., N. Logan Leven, M.D., and Lyle A. Tongen, M.D., Saint Paul, Minnesota........ 647

Industrial Deafness—Every Physician's Problem
Kinsey M. Simonton, M.D., Rochester, Minnesota...... 655

A Clinical Method of Assessing Drug Therapy in Parkinsonism
Sidney K. Shapiro, M.D., Minneapolis, Minnesota...... 659

Cardiac Arrest
Gilbert S. Campbell, M.D., Minneapolis, Minnesota.. 661

Recent Advances in the Field of Homologous Transplants
Richard H. Egdahl, M.D., Minneapolis, Minnesota.... 665

Comparative Effectiveness of a Weighed Reduction Diet and an Approximate-Measure Diet
Ruth E. Franklin, B.S., M.N.S., and *Edward H. Rynearson, M.D.,* Rochester, Minnesota................

CASE PRESENTATION

Renal Artery Aneurysm Causing Malignant Hypertension
Robert C. Davidson, M.D., and *John I. Coe, M.D.,* Minneapolis, Minnesota ....

CONTINUATION STUDIES

Acute Cholecystitis and Choledocholithiasis
George S. Bergh, M.D., Minneapolis, Minnesota........

CURRENT CONCEPTS

Functional Heart Pain
Geoffrey Bourne, London, England..............................

SEMINAR

Reactions to Penicillin. II. The Incidence of Mild Reactions to Procaine Penicillin G in Aqueous Suspension
Donald J. Corr, M.D., and *William E. Wellman, M.D.,* Rochester, Minnesota.......................................

TUMOR CONFERENCE

Case Study, St. Barnabas Hospital
Claude Hitchcock, M.D., Section Editor.....................

Official Journal of

Duluth Surgical Society
Minneapolis Academy of Medicine
Minneapolis Obstetrical and Gynecological Society
Minneapolis Surgical Society
Minnesota Academy of Medicine
Minnesota Obstetric and Gynecologic Society

Owner and Publisher

Published by MINNESOTA STATE MEDICAL ASSOCIATION
496 Lowry Medical Arts Building
St. Paul 2, Minnesota

Editing and Publishing Committee

E. M. Hammes, M.D.
Chairman, Saint Paul

F. M. Owens, Jr., M.D.
Saint Paul

T. A. Peppard, M.D.
Minneapolis

Henry Ulrich, M.D.
Minneapolis

Business Manager

R. R. Rosell
496 Lowry Medical Arts Building
St. Paul 2, Minnesota

GENER

Authors

Manuscripts should be addressed to Arthur H. Wells, M.D., Editor, 915 East F
Street, Duluth 5, Minnesota. Telephone RA 7-6636 or JA 5-2319. Original papers prep
for publication solely in Minnesota Medicine will be considered by the Board of Edi
providing they fulfill the following editorial standards. Manuscripts should be ty
double spaced on white paper with at least 1-inch margins. The original (not a car
copy) is requested. The title on the first page should be under six words if poss
or divided into two parts. The author should give his highest degree, his instituti
position or his relationship to a hospital or medical organization which he may
addressing. Pages should be numbered consecutively and the author's last name sh
appear at the top of each page after the first page.

Biographical references should appear on a separate sheet entitled "Bibliography." T
should appear and be numbered consecutively in the order in which they first occu
the text (not alphabetically). Citations in the text require reference numbers if
author's or authors' names are not used or if there is more than one reference to
same author or group of authors. All references to author should appear in
Bibliography and no references should be included which are not in the text. The
and exact punctuation used in the J.A.M.A. references is requested. For a journal this
Author's last name, initial, initial.: title of paper. Abbreviated name of journal, vol
number: page, year. Book references should give author, title, edition number,
publisher and year.

Illustrations (photographs, tables and graphs) should be submitted separately and
combined in the text. There should be a separate sheet entitled "Illustrations" wh
contains the various types of illustrations listed separately and numbered in the o

Medicine

Volume 39
Number 10

October, 1956

MISCELLANEOUS ARTICLES

ITORIALS

e Psychiatric Social Worker in Psychosomatic Medicine 681
hat Does "Blue Shield" Mean to You? 681
e Tracings of Arterial and Venous Pulsations 682
Facts of Life 683
e Etching Process 683
e History of Glass Containers 684
habilitation in Pulmonary Tuberculosis 685
e Ballistocardiogram 686

SIDENT'S LETTER

pendent Medical Care 687

MMITTEE ACTION

berculosis 688

DICAL ECONOMICS

gislative Review of the 84th Congress 690
mit Raised on Charitable Contributions to Medical Research Groups 692
edical Schools in United States Show Vast Expansion 692
ecent Surveys Reveal Statistics of Interest to Physicians 692

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

License of Sandstone Physician Revoked 693

HISTORY OF MEDICINE IN MINNESOTA

The Medical History of Rice County (1855-1901)
Adolph M. Hanson, M.D., Faribault, Minnesota
(Conclusion) 694

MEETINGS AND ANNOUNCEMENTS 700

WOMAN'S AUXILIARY 701

IN MEMORIAM A-38

GENERAL INTEREST

Personal Items A-40
New Locations A-42
Minnesota Blue Shield-Blue Cross A-43

BOOK REVIEWS A-44

innesota Society of Clinical Pathologists
innesota Society of Internal Medicine
innesota Society of Neurology and Psychiatry
innesota State Medical Association
Minnesota Surgical Society
Northern Minnesota Medical Association
Saint Paul Surgical Society
Southern Minnesota Medical Association

ORMATION

which they appear in the text. All photographs must be in black and white, clear contrasting, and on glossy prints. Instructions for combining photographs are ptable. Any number of illustrations over 4 are charged to the author. Combinations hotographs up to one-half page (6 x 4⅜ inches) count as 1 illustration.

ders and Reviewers

he right is reserved to reject material submitted for reading or advertising columns. views expressed in this journal do not necessarily represent those of the Minnesota e Medical Association or any of its constituents.

vertisers and Subscribers

lassified advertising—10 cents a word; minimum charge $2.00; key number, 25c itional. Remittance should accompany order. Display advertising rates on request.

nnual Subscription—$3.00. Single Copies—$0.40. Foreign and Canadian—$3.50.

ommunications concerning advertising and subscriptions should be addressed to NNESOTA MEDICINE, 2642 University Avenue, Saint Paul 14, Minnesota. Telephone Mid- 6-2641.

pyright and Post Office Entry

ontents of MINNESOTA MEDICINE ©1956 by Minnesota State Medical Association.

ntered at the Post Office in Saint Paul as second class matter. Accepted for mailing at special rate of postage provided for in Section 1103, Act of October 3, 1917, horized July 13, 1918.

Board of Editors

ARTHUR H. WELLS, M.D.
Editor-in-Chief, Duluth

STUART W. ARHELGER, M.D.
Minneapolis

JOHN F. BRIGGS, M.D.
Saint Paul

S. FRANCIS CEPLECHA, M.D.
Redwood Falls

TAGUE C. CHISHOLM, M.D.
Minneapolis

ROBERT B. HOWARD, M.D.
Minneapolis

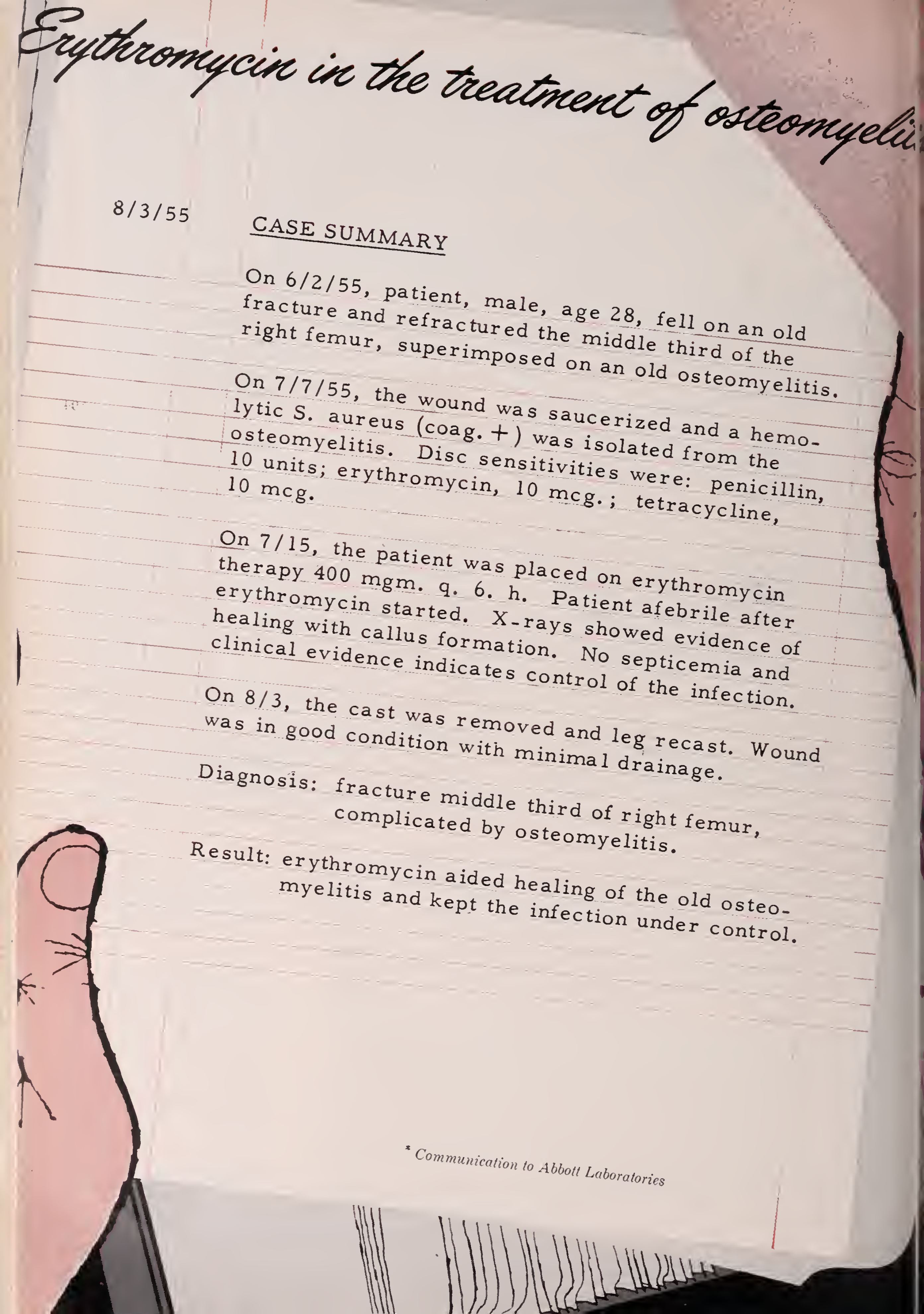
R. DREW MILLER, M.D.
Rochester

HENRY G. MOEHRING, M.D.
Duluth

GLENN J. MOURITSEN, M.D.
Fergus Falls

OLIVE V. SEIBERT, B.A.
Saint Paul

GEORGE STILWELL, M.D.
Rochester



Erythromycin in the treatment of osteomyeli

8/3/55

CASE SUMMARY

On 6/2/55, patient, male, age 28, fell on an old fracture and refractured the middle third of the right femur, superimposed on an old osteomyelitis.

On 7/7/55, the wound was saucerized and a hemolytic S. aureus (coag. +) was isolated from the osteomyelitis. Disc sensitivities were: penicillin, 10 units; erythromycin, 10 mcg.; tetracycline, 10 mcg.

On 7/15, the patient was placed on erythromycin therapy 400 mgm. q. 6. h. Patient afebrile after erythromycin started. X-rays showed evidence of healing with callus formation. No septicemia and clinical evidence indicates control of the infection.

On 8/3, the cast was removed and leg recast. Wound was in good condition with minimal drainage.

Diagnosis: fracture middle third of right femur, complicated by osteomyelitis.

Result: erythromycin aided healing of the old osteomyelitis and kept the infection under control.

---

* *Communication to Abbott Laboratories*

ecific against

ccic infections

Specific—because you can actually pinpoint the therapy for coccic infections. That's because most bacterial respiratory infections are caused by staph-, strep-and pneumococci. And these are the very organisms most sensitive to Erythrocin—even when in many cases they resist other antibiotics.

filmtab®

Erythrocin®

(Erythromycin, Abbott)

STEARATE

th little risk of

rious side effects

Low toxicity—because Erythrocin rarely alters intestinal flora. Thus, your patients seldom get gastroenteral side effects. Or loss of vitamin synthesis in the intestine. Virtually, no allergic reactions, either. *Filmtab* Erythrocin Stearate (100 and 250 mg.), bottles of 25 and 100.

Abbott

filmtab®

Erythrocin®

(Erythromycin, Abbott)

STEARATE

® Filmtab—film-sealed tablets; pat. applied for

609216

recognized
as a potent, specific anti-arthritic

established
by over 100 million patient days

substantiated
in more than 700 published reports

BUTAZOLIDIN®

(phenylbutazone GEIGY)

potent, specific
anti-arthritic

Based on an impressive background of achievement attained over a period of four years involving both long-term and short-term therapy in all the major forms of arthritis, Butazolidin is recognized as one of the most effective anti-arthritic agents currently available.

relieves pain
improves function
resolves inflammation

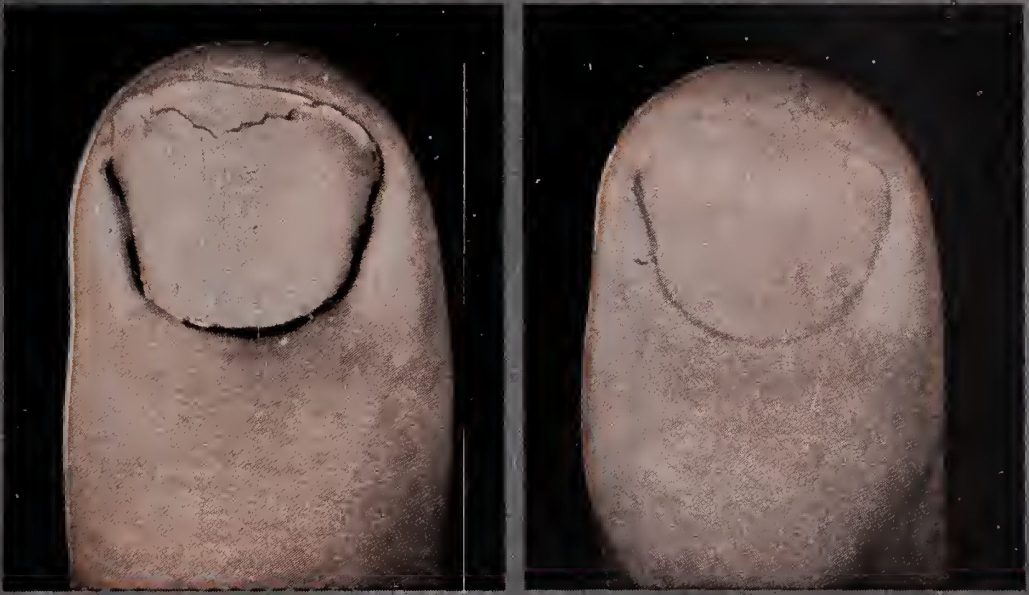
Butazolidin being a potent therapeutic agent, physicians unfamiliar with its use are urged to send for literature before prescribing it.

GEIGY

GEIGY PHARMACEUTICALS, Division of Geigy Chemical Corporation, New York 13, N. Y.

72556

KNOX Protein Previews



New Study Shows Gelatine Restores Brittle Fingernails to Normal

Directions for making the Knox Gelatine drink in every package

KNOX
32
UNFLAVORED
GELATINE

Brittle, fragile or laminating fingernails are the bane of many a woman's existence. Yet this highly prevalent and distressing condition often has gone uncontrolled for lack of effective therapy. Now, you can promise these patients substantial relief in a large percentage of cases.

In a recent study[1] that confirmed previous work[2] Knox Gelatine was used to treat 36 women with fragile, brittle, laminating fingernails. The response was most gratifying. Except for three patients who discontinued the therapy, three diabetics, and two women who had congenital deformities, the splitting ceased and all other patients were able to manicure their nails to a full point by the time the study ended.

Optimal dosage proved to be one envelope (7 grams) of Knox Gelatine administered daily for three months. Efficacy has not been established with lesser dosage. If you would like more complete details of this work, just use the coupon.

---

1. Rosenberg, S. and Oster, K. A., "Gelatine in the Treatment of Brittle Nails," *Conn. State Med. J.* **19**:171-179, March 1955.
2. Tyson, T. L., *J. Invest. Dermat.* **14**:323, May 1950.

Chas. B. Knox Gelatine Company, Inc.
Professional Service Dept. SJ-19
Johnstown, N. Y.

Please send me a reprint of the article by Rosenberg and Oster with illustrated color brochure.

YOUR NAME AND ADDRESS

A NEW

Chemical Compound

for the treatment of

PEPTIC ULCERS and HYPERACIDITY

GLYCAMINE®

TABLETS

GLYCAMINE BRAND OF HYDROXY ALUMINUM
MAGNESIUM AMINOACETATE
PAT. PEND.

PROMPT, LONG LASTING RELIEF — One tablet is sufficient to neutralize excess acidity and maintain optimum pH for 4½ hours.

A NEW CHEMICAL COMPOUND — Designed to perform a specific function . . . not a mixture of alkalis. Will not disturb acid-base balance.

RE-ESTABLISHES NORMAL DIGESTION — Does not affect enzymatic activity. Improves patient well being.

CONTROLLED ACTION — Does not stimulate acid secretion or alkalosis. No acid rebound.

NON-SYSTEMIC — Neither constipating nor laxative. Demulcent protective coating covers abraded mucosa.

COMPATIBLE — With antispasmodics and anticholinergics. Reduces gastric distress caused by many drugs.

LOW DOSAGE — Only four pleasant tasting, chew-up tablets daily. Economical to use. Assures better patient co-operation.

AVAILABLE — In bottles of 100, 500 and 1000 tablets in all drug stores.

For latest professional information and samples write

DALCO PHARMACAL CO.

Minneapolis 2, Minn.

Division of

JOSEPH E. DAHL CO., Minneapolis and St. Paul

excellent
remedy
for a
poor
appetite

INCREMIN*

Lysine-Vitamin Drops

- combines the amino acid, l-Lysine, with vitamins B_1, B_6, B_{12}
- stimulates appetite, effects better utilization of protein, thereby promoting growth
- cherry-flavored drops are delicious; may also be mixed in milk, formula, etc.
- handy 15 cc. plastic dropper-bottle

For the problem eaters, for the underweight, for the generally below-normal child

(Excellent, too, for stimulating appetites of the elderly patient!) Dosage: 0.5 to 1 cc. (10-20 drops) daily. Each cc. (20 drops) contains:

l-Lysine	300 mg.
Vitamin B_{12}	25 mcgm.
Thiamine (B_1)	10 mg.
Pyridoxine (B_6)	5 mg.

Lederle

LEDERLE LABORATORIES DIVISION
AMERICAN CYANAMID COMPANY
PEARL RIVER, NEW YORK

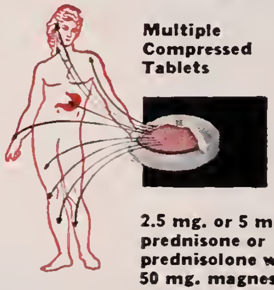
*REG. U. S. PAT. OFF.

in inflammatory skin diseases
all the benefits of the "predni-steroids"
plus positive antacid action
to minimize gastric distress

ROUTINELY ACHIEVED WITH

'Co-Deltra'

(Buffered Prednisone)



Multiple Compressed Tablets

'Co-Hydeltra'

(Buffered Prednisolone)

Clinical evidence[1,2,3] indicates that to augment the therapeutic advantages of prednisone and prednisolone, antacids should be *routinely* co-administered to minimize gastric distress.

References: 1. Boland, E. W., *J.A.M.A.* 160:613, (February 25,) 1956. 2. Margolis, H. M. *et al*, *J.A.M.A.* 158:454, (June 11,) 1955. 3. Bollet, A. J. *et al*, *J.A.M.A.* 158:459, (June 11,) 1955.

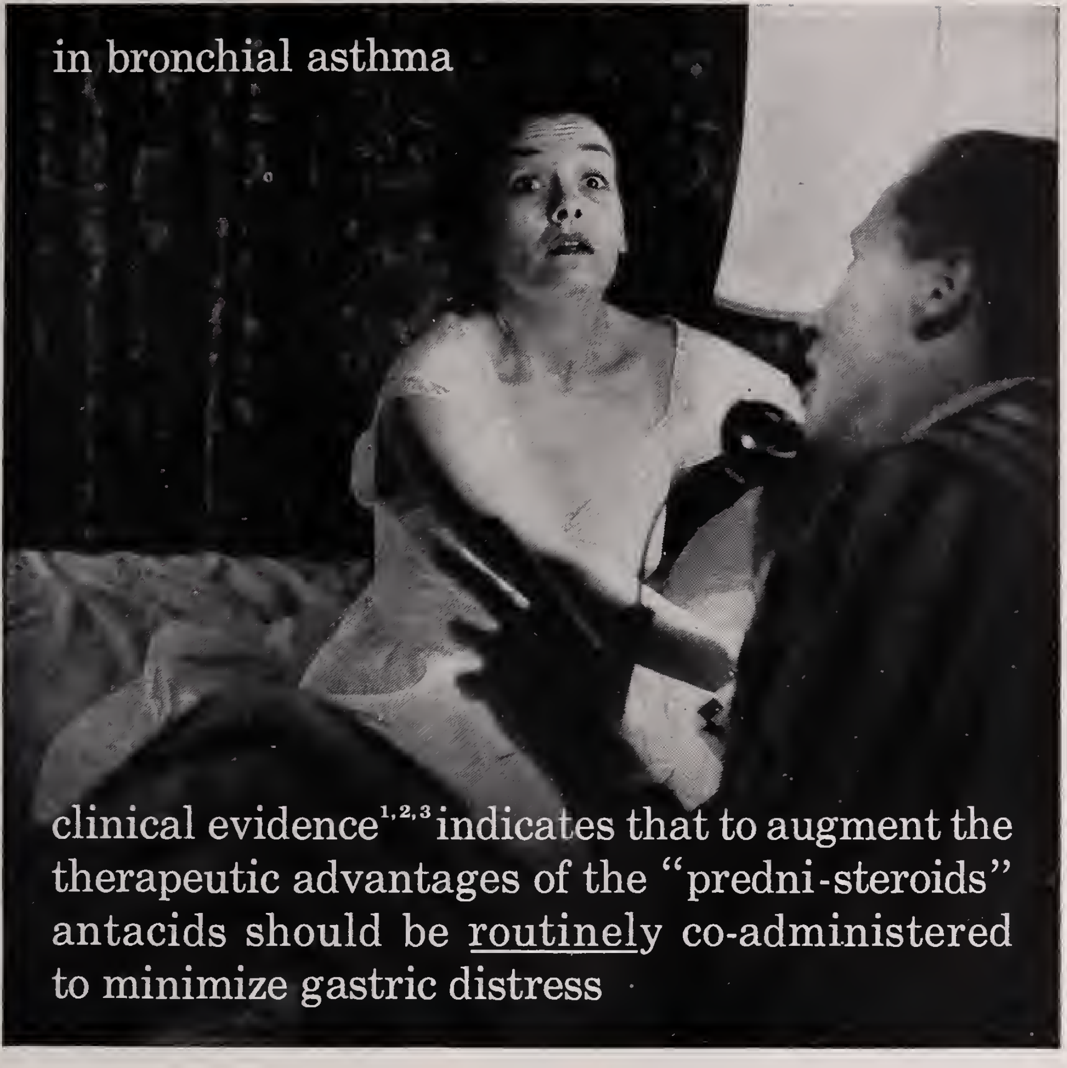
2.5 mg. or 5 mg. prednisone or prednisolone with 50 mg. magnesium trisilicate and 300 mg. aluminum hydroxide gel.

MSD

MERCK SHARP & DOHME
DIVISION OF MERCK & CO., INC.
PHILADELPHIA 1, PA.

'CO-DELTRA' *and* 'CO-HYDELTRA' *are the trademarks of* MERCK & CO., INC.

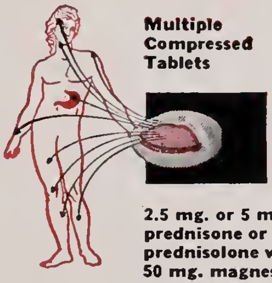
in bronchial asthma



clinical evidence[1,2,3] indicates that to augment the therapeutic advantages of the "predni-steroids" antacids should be routinely co-administered to minimize gastric distress

ROUTINE
CO-ADMINISTRATION
MEANS

'Co-Hydeltra'
(Buffered Prednisolone)



Multiple Compressed Tablets

'Co-Deltra'
(Buffered Prednisone)

All the benefits of the "predni-steroids" plus positive antacid action to minimize gastric distress.

2.5 mg. or 5 mg. prednisone or prednisolone with 50 mg. magnesium trisilicate and 300 mg. aluminum hydroxide gel.

MSD
MERCK SHARP & DOHME
DIVISION OF MERCK & CO., INC.
PHILADELPHIA 1, PA.

References: 1. Boland, E. W., *J.A.M.A.* 160:613, (February 25,) 1956. 2. Margolis, H. M. *et al*, *J.A.M.A.* 158:454, (June 11,) 1955. 3. Bollet, A. J. *et al*, *J.A.M.A.* 158:459, (June 11,) 1955.

'CO-DELTRA' *and* 'CO-HYDELTRA' *are the trademarks of* MERCK & CO., INC.

NEW

ATARAXOID is a unique, new combination of STERANE and ATARAX, which now permits simultaneous symptomatic control and reduction of attendant anxiety and apprehension in rheumatoid arthritis and other indications.

The added tranquilizer control, desirably easing mental stress, also directly assists clinical progress. It minimizes the chance of exacerbation related to emotional strain and facilitates patient confidence and coöperation in the therapeutic program toward maximum rehabilitation.

ATARAXOID exerts the anti-rheumatic, anti-inflammatory activity of STERANE distinctly superior to previous steroids, effective in radically reduced dosage, and with minimal disturbance of electrolyte and fluid metabolism.

The ataractic effect is a central neuro-relaxing action – the result of a marked cerebral specificity – free of mental fogging and devoid of any major complications: no liver, blood or brain damage. This peace-of-mind component is also used in the lowest dosage range.

Supplied: Each green, scored, ATARAXOID oral tablet contains 5 mg. prednisolone (STERANE) and 10 mg. hydroxyzine hydrochloride (ATARAX). Bottles of 30 and 100.

PFIZER LABORATORIES
Division, Chas. Pfizer & Co., Inc.
Brooklyn 6, New York

the first and only ataraxic-corticoid

araxoid*

prednisolone and hydroxyzine

Pfizer

combining the newest, safest tranquilizer, ATARAX® + the newest, most effective steroid, STERANE® (prednisolone)

simultaneously controls the symptoms and the apprehension

In Rheumatoid Arthritis, other collagen diseases, bronchial asthma and inflammatory dermatoses

*Trademark

KARO® SYRUP . . . meets the accelerated nutritional requirement of early infancy

The high caloric requirements of infants, coupled with the fact that they have little ability to digest starchy food, are indications for the use of an easily digested carbohydrate milk modifier.

Karo places a minimum demand upon the digestive system during the first weeks of life. Even premature babies thrive on Karo because this easily digested, completely utilized, fluid mixture of dextrins, maltose and dextrose does not induce flatulence, colic, fermentation or allergy.

Karo permits easy adjustment of formula to meet the accelerated nutritional demand during the early months of rapid growth. Mothers will appreciate the ease of making formulas containing Karo, plus its ready availability and economy. Light or dark Karo syrup may be used interchangeably with cow's milk or evaporated milk and water. Each ounce yields 120 calories.

Karo
SYRUP
CRYSTAL WHITE

1906 • 50th ANNIVERSARY • 1956
CORN PRODUCTS REFINING COMPANY
17 Battery Place, New York 4, N. Y.

ournal Report:

Hypertensive symptoms relieved in 96% of patients

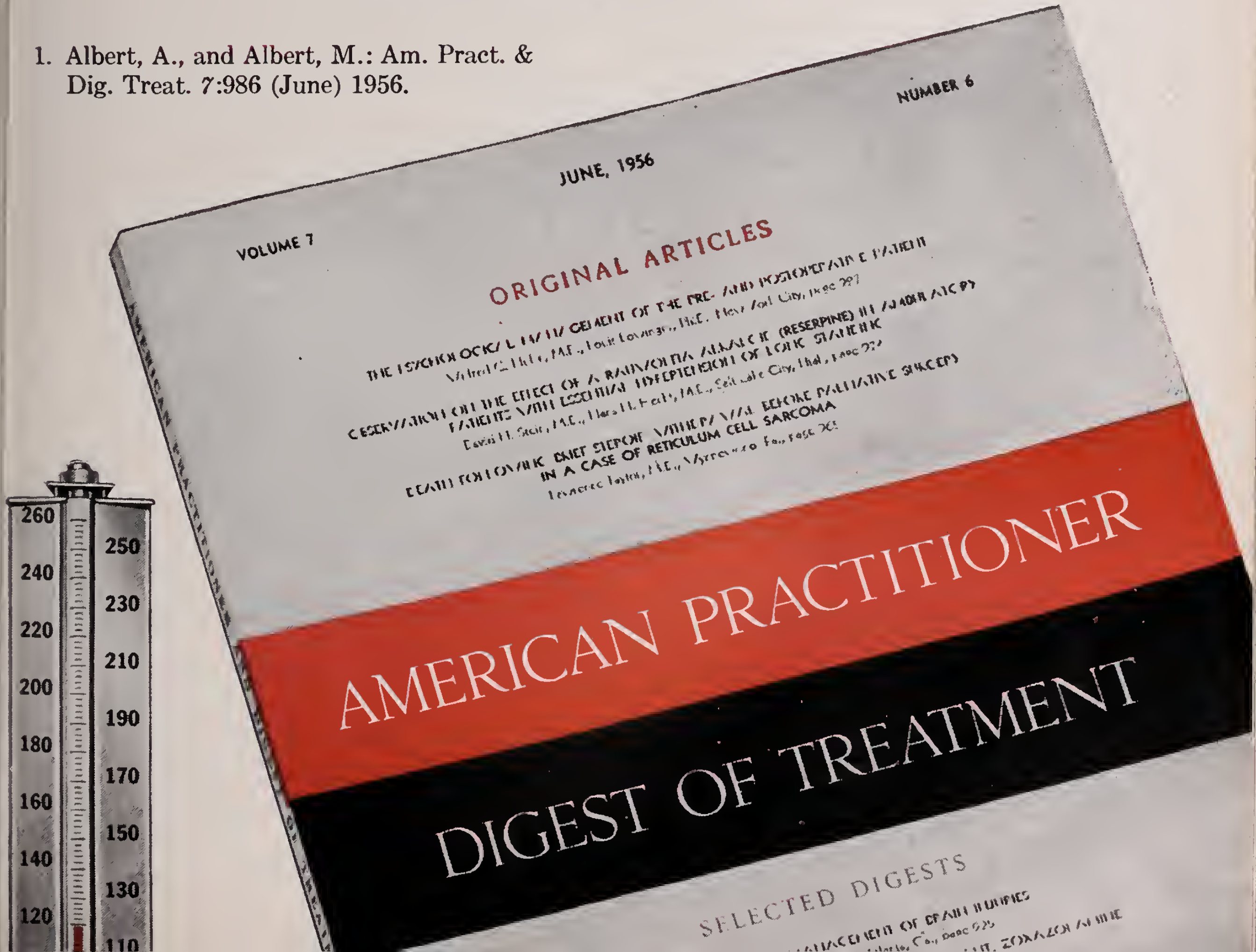
Comparison of pentolinium [ANSOLYSEN] with other preparations in 25 patients with evere essential hypertension, for whom all other methods of management had failed, howed that pentolinium is the most effective of available agents in reducing dangerusly high blood pressure to the desired levels, and in modifying some of the complicaions of hypertension, as cardiac decompensation, cardiomegaly and retinopathy. . . .

'In 96 per cent (24 patients) clinical symptoms were relieved and the blood pressure naintained at comfortable levels. . . ."[1]

ANSOLYSEN®
TARTRATE
Pentolinium Tartrate
Lowers Blood Pressure

Wyeth®
Philadelphia 1, Pa.

[1] Albert, A., and Albert, M.: Am. Pract. & Dig. Treat. 7:986 (June) 1956.


VOLUME 7
JUNE, 1956
NUMBER 6
ORIGINAL ARTICLES
AMERICAN PRACTITIONER
DIGEST OF TREATMENT
SELECTED DIGESTS

Upjohn

Ulcer protection that lasts all night:

Pamine* BROMIDE

Tablets

Each tablet contains:
Methscopolamine bromide .... 2.5 mg.

Average dosage (ulcer):
One tablet one-half hour before meals, and 1 to 2 tablets at bedtime.

Supplied: Bottles of 100 and 500 tablets

Syrup

Each 5 cc. (approx. 1 tsp.) contains:
Methscopolamine bromide .... 1.25 mg.

Dosage:
1 to 2 teaspoonfuls three or four times daily.

Supplied: Bottles of 4 fluidounces

Sterile Solution

Each cc. contains:
Methscopolamine bromide .... 1 mg.

Dosage:
0.25 to 1.0 mg. (¼ to 1 cc.), at intervals of 6 to 8 hours, subcutaneously or intramuscularly.

Supplied: Vials of 1 cc.

*TRADEMARK, REG. U. S. PAT. OFF.—THE UPJOHN BRAND OF METHSCOPOLAMINE

The Upjohn Company, Kalamazoo, Michigan

ROCHE

HOFFMANN-LA ROCHE INC.

ARMACEUTICALS AND VITAMINS • ROCHE PARK • NUTLEY 10 • NEW JERSEY • NUTLEY 2 5000

NEWS RELEASE

From: Public Relations Department
NUtley 2-5000, Extension 731

For Immediate Release

Only two doses a day are needed in most cases when the new antibacterial, Lipo Gantrisin 'Roche,' is used. Recent studies indicate that Lipo Gantrisin provides adequate blood levels for at least twelve hours; this is why it usually produces a round-the-clock effect with one dose in the morning and another at night. In exceptionally severe infections, three to four doses a day may be used initially.

Lipo Gantrisin Acetyl contains Gantrisin Acetyl in a readily absorbable vegetable oil emulsion. It provides the same therapeutic advantages as Gantrisin -- wide antibacterial spectrum, little likelihood of renal blocking, no need for alkalies or forcing of fluids, and an exceptionally low incidence of side effects.

Each teaspoonful of Lipo Gantrisin® Acetyl (acetyl sulfisoxazole) provides the equivalent of 1 Gm of Gantrisin -- twice the concentration of most liquid sulfonamide preparations. The small volume of each dose and the two-a-day dosage schedule are of special value in the treatment of children and elderly invalids.

(end)

NEWS RELEASE

. . part of *every illness*

ANXIETY

is part of

PEPTIC ULCER

Equanil®

MEPROBAMATE
(2-methyl-2-*n*-propyl-1,3-propanediol dicarbamate)
Licensed under U.S. Pat. No. 2,724,720

". . functional nervousness, including fatigue and anxiety, was by far he greatest detectable cause of recurrences of peptic ulcer symptoms, and n many instances it seemed likely that the same etiological factors were nitially responsible for the ulcer."[1]

Peptic ulcer is a combination of the emotional and the physi-al. For total management, a combination of measures is often ndicated. EQUANIL adds to the adequacy of routine treatment y countering psychic stress as a stimulant to vagal activity. t combats the anxiety and tension, and encourages restful sleep.[2]

In every patient . . . a valuable adjunct to the customary therapy

Supplied: Tablets, 400 mg., bottles of 50.
Usual Dose: 1 tablet, t.i.d.

1. Weiss, E., and English, O.S.: Psychosomatic Medicine. W. B. Saunders Co., Philadelphia, 1949, p. 358.
2. Lemere, F.: Northwest Med. *54*:1098 (Oct.) 1955.

anti-anxiety factor with muscle-relaxing action

Wyeth®
Philadelphia 1, Pa.

"You try to scrub the bathtub with your back aching morning till night!"
"I don't know about bathtubs, but two days ago I couldn't reach a shelf higher than that."
"I thought maybe I slept in a draft. Never had a stiff neck like this before."
"That's nothing. I went around with my arm in a sling for nearly two weeks—had to sleep with a pillow at my back so I wouldn't roll over on it."
"I thought I was getting too old for high heels—low heels didn't help. My leg hurt down to the ankle."
"That's f
I'm on m
feet all
but it w
my arm
bothere

...safeguarded relief all the way across th

Prednisone + Acetylsalicylic Acid + Aluminum Hydroxide + Ascorbic Ac

Potent corticosteroid anti-inflammatory action complemented by ra
analgesia; doubly protected with antacid and supplemental vitamin

5G-J-486

"My back was so tight I couldn't even get on and off the bus; now I can climb stairs."
"I hope he helps my knee that quick."
"Take it from me, you should be glad you saw him early in the game so he could do some good."
"Good?—why, he's got me doing exercises I haven't done in years."

pread of common rheumatic complaints

Summated, protective corticoid-analgesic therapy

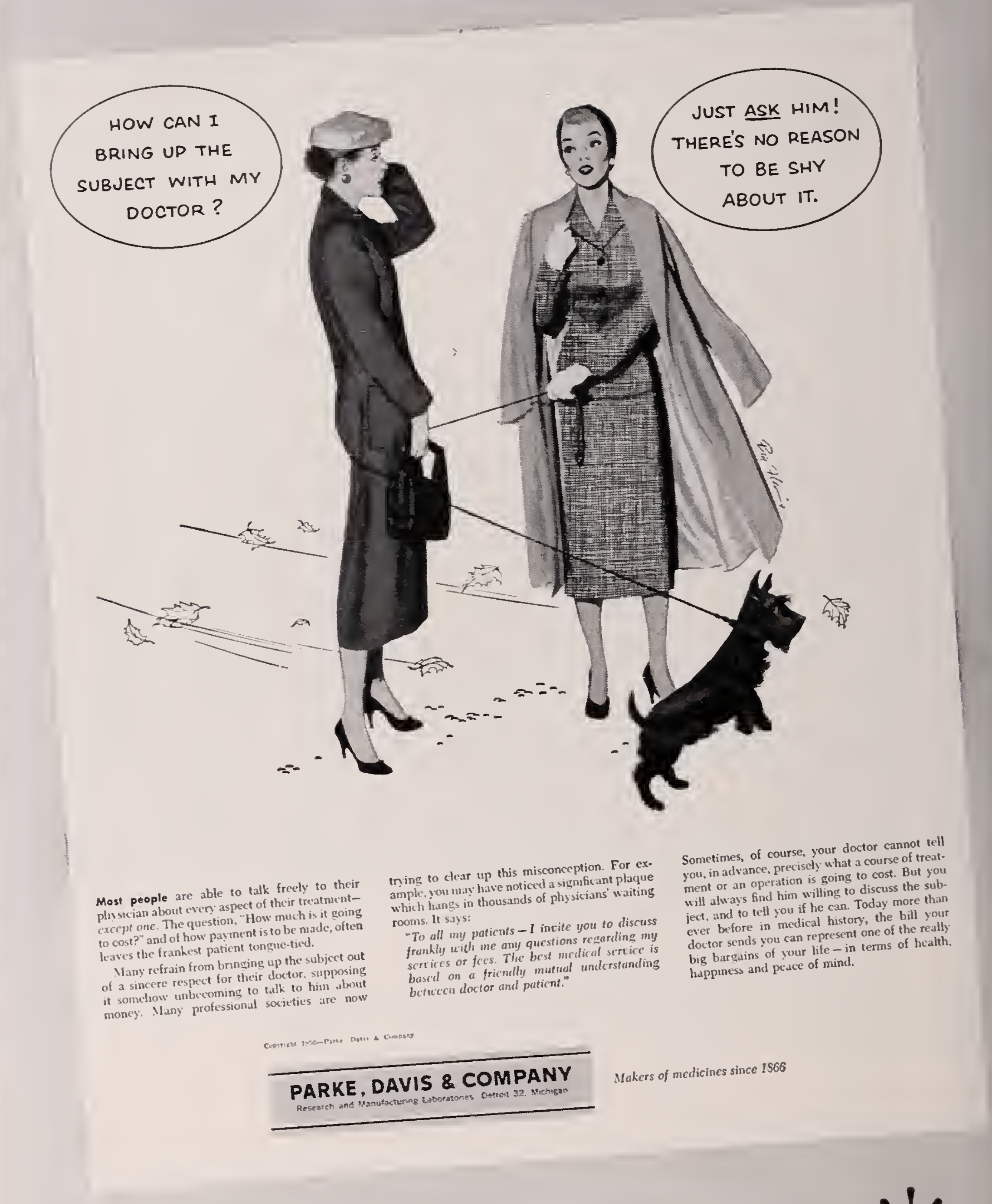
SIGMAGEN*

corticoid-analgesic compound tablets

- brings specific, complementary benefits to the treatment of muscle, ligament, tendon, bursa and nerve inflammation
- for the initiation of treatment of milder rheumatic disease
- for continuous or intermittent maintenance in more severe rheumatic involvement

Bottles of 100 and 1000.

Schering


HOW CAN I BRING UP THE SUBJECT WITH MY DOCTOR ?
JUST ASK HIM! THERE'S NO REASON TO BE SHY ABOUT IT.

Most people are able to talk freely to their physician about every aspect of their treatment—*except one*. The question, "How much is it going to cost?" and of how payment is to be made, often leaves the frankest patient tongue-tied.

Many refrain from bringing up the subject out of a sincere respect for their doctor, supposing it somehow unbecoming to talk to him about money. Many professional societies are now trying to clear up this misconception. For example, you may have noticed a significant plaque which hangs in thousands of physicians' waiting rooms. It says:

> *"To all my patients—I invite you to discuss frankly with me any questions regarding my services or fees. The best medical service is based on a friendly mutual understanding between doctor and patient."*

Sometimes, of course, your doctor cannot tell you, in advance, precisely what a course of treatment or an operation is going to cost. But you will always find him willing to discuss the subject, and to tell you if he can. Today more than ever before in medical history, the bill your doctor sends you can represent one of the really big bargains of your life—in terms of health, happiness and peace of mind.

Copyright 1956—Parke, Davis & Company

PARKE, DAVIS & COMPANY
Research and Manufacturing Laboratories Detroit 32, Michigan

Makers of medicines since 1866

PARKE, DAVIS & COMPANY

PARKE, DAVIS & COMPANY

PARKE, DAVIS & COMPANY

Doctor, you have probably seen one or more of these current Parke-Davis advertisements in leading general magazines—and you know that the much-talked-about theme of these ads is that *prompt and proper medical care is one of today's biggest bargains.* Through our sales representatives who call on you, and your letters to us, we know that this is the type of laity advertising *you* like to see.

The reproduction on the facing page is the latest example of this advertising. It tells the public that they can discuss medical fees with their physicians without embarrassment . . . and that such discussions improve the important relationship between doctor and patient.

We are gratified at your response to these public messages, and you can be sure that Parke-Davis national advertising will continue to be in our *mutual* best interests.

PARKE, DAVIS & COMPANY
Detroit 32, Michigan

Reaching millions of people in LIFE, POST, TODAY'S HEALTH and other leading magazines

PARKE, DAVIS & COMPANY

PARKE, DAVIS & COMPANY

PARKE, DAVIS & COMPANY

24-hour control

for the majority of diabetics

10 cc.
'WELLCONE'
LOBIN INSUL
WITH ZINC
'B. W. & CO.'
40 UNITS IN 1 CC
KEEP IN A COLD PLACE
Burroughs Wellcome
MADE IN U.S.A.

GLOBIN INSULIN

'B. W. & CO.'®

a clear solution . . . easy to measure accurately

Discovered by Reiner, Searle, and Lang
in The Wellcome Research Laboratories

BURROUGHS WELLCOME & CO. (U. S. A.) INC. • Tuckahoe 7, New York

New
Evidence
on

Rauwiloid®

confirms and defines superiority over other Rauwolfia preparations in the treatment of HYPERTENSION

- Rauwiloid represents the balanced, mutually potentiated actions[1] of several Rauwolfia alkaloids, of which reserpine and the equally antihypertensive rescinnamine have been isolated.
- Hence, reserpine is not the total active antihypertensive principle of the rauwolfia plant.
- Rauwiloid is freed of the undesirable alkaloids of the whole rauwolfia root. Recent investigations confirm the desirability of Rauwiloid (because of the balanced action of its contained alkaloids) over single alkaloidal preparations; "...mental depression...was...less frequent with alseroxylon..."[2]

The dose-response curve of Rauwiloid is flat, and its dosage is uncomplicated and easy to prescribe...merely two 2 mg. tablets at bedtime.

---

1. Cronheim, G., and Toekes, I. M.; Comparison of Sedative Properties of Single Alkaloids of Rauwolfia and Their Mixtures, Meet. Am. Soc. Pharmacol. & Exper. Therap., Iowa City, Iowa, Sept. 5, 1955.
2. Moyer, J. H.; Dennis, E., and Ford, R.: Drug Therapy (Rauwolfia) of Hypertension. II. A Comparative Study of Different Extracts of Rauwolfia When Each Is Used Alone (Orally) for Therapy of Ambulatory Patients with Hypertension, A.M.A. Arch. Int. Med. *96*:530 (Oct.) 1955.

Riker
LOS ANGELES

Rauwiloid is the original alseroxylon fraction of India-grown Rauwolfia serpentina, Benth., a Riker research development.

Microscopic analysis shows the Viceroy tip has...
20,000 FILTERS
Viceroy
TWICE AS MANY FILTERS
Brand B
Only HALF the FILTERS
Brand C
LESS than HALF the FILTERS
TWENTY
VICEROY
VICEROY
Filter Tip
CIGARETTES
KING-SIZE

HERE'S WHY SO MANY DOCTORS NOW SMOKE AND RECOMMEND

VICEROY

Twice as Many Filters

AS THE OTHER TWO LARGEST-SELLING FILTER BRANDS

For the Smoothest Taste in Smoking!

COMPARE! HOW MANY FILTERS IN YOUR FILTER TIP? (REMEMBER—THE MORE FILTERS THE SMOOTHER THE TASTE!)

VICEROY'S EXCLUSIVE FILTER IS MADE FROM PURE CELLULOSE—SOFT, SNOW-WHITE, NATURAL!

relaxes both the body and the mind

well suited for prolonged therapy

- well tolerated, nonaddictive, essentially nontoxic
- no blood dyscrasias, liver toxicity, Parkinson-like syndrome or nasal stuffiness
- chemically unrelated to chlorpromazine or reserpine
- does not produce significant depression
- orally effective within 30 minutes for a period of 6 hours

Indications: **anxiety and tension states, muscle spasm.**

THE ORIGINAL MEPROBAMATE

Miltown®

Tranquilizer with muscle-relaxant action

DISCOVERED AND INTRODUCED
BY WALLACE LABORATORIES, *New Brunswick, N.J.*

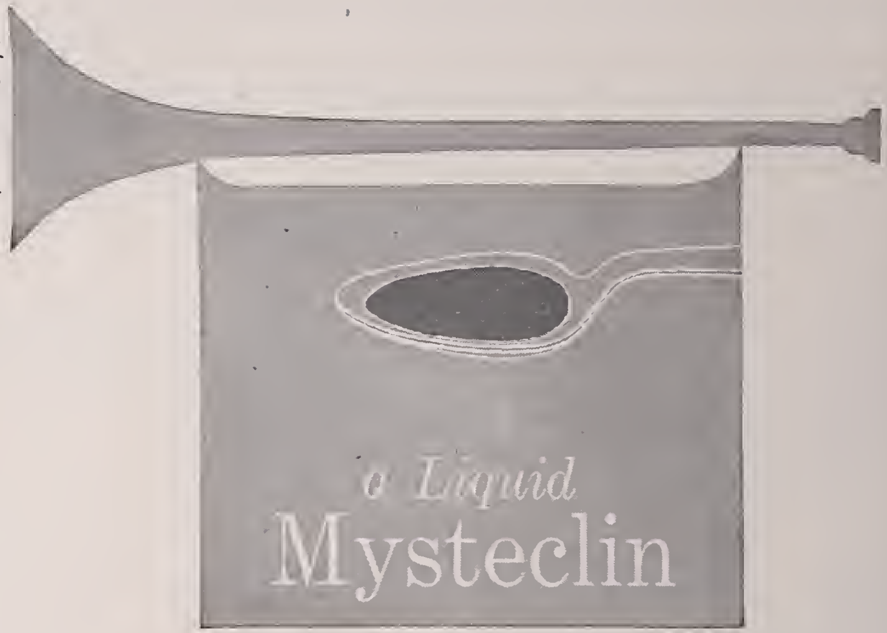
2-methyl-2-n-propyl-1,3-propanediol dicarbamate—U.S. Patent 2,724,720

SUPPLIED: *400 mg. scored tablets. Usual dose: 1 or 2 tablets t.i.d.*

Literature and Samples Available on Request

THE MILTOWN MOLECULE

NOW



MYSTECLIN SUSPENSION

Steclin-Mycostatin (Squibb Tetracycline-Nystatin)

Another form of the only broad spectrum antibiotic preparation with added protection against monilial superinfection

PLEASANT TASTING — Mysteclin Suspension is pleasantly fruit-flavored and will appeal to taste-conscious youngsters as well as to adults who prefer liquid medication.

BROADLY EFFECTIVE — Mysteclin Suspension provides well tolerated therapy for the many common infections which respond to tetracycline—and also acts to prevent monilial overgrowth.

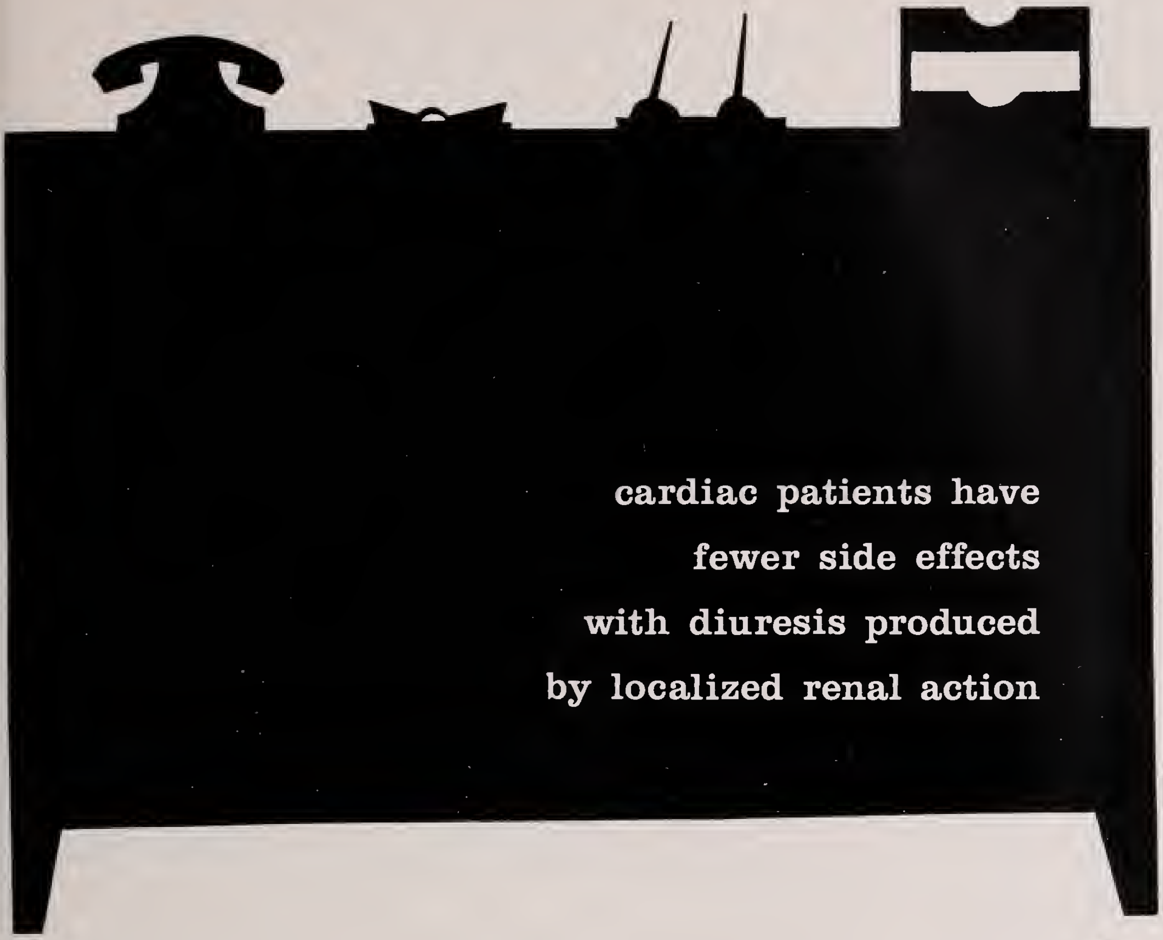
READY-TO-TAKE — Mysteclin Suspension requires no reconstitution and can be given by simple teaspoon dosage to patients of all ages.

MYSTECLIN SUSPENSION: a fruit-flavored oil suspension containing the equivalent of 125 mg. Steclin (Squibb Tetracycline) Hydrochloride and 125,000 units Mycostatin (Squibb Nystatin) per 5 cc. teaspoonful. Supplied in two-ounce bottles.

Also available as Capsules (250 mg. Steclin Hydrochloride and 250,000 units Mycostatin) and Half Strength Capsules (125 mg. Steclin Hydrochloride and 125,000 units Mycostatin).

SQUIBB *Squibb Quality — the Priceless Ingredient*

'MYSTECLIN'®, 'STECLIN'®, AND 'MYCOSTATIN'® ARE SQUIBB TRADEMARKS


cardiac patients have
fewer side effects
with diuresis produced
by localized renal action

PATIENTS IN FAILURE NEED AN ORGANOMERCURIAL

When acidosis is the diuretic mechanism, as with the carbonic anhydrase inhibitors and acidifying salts, widespread effects on many organs can be anticipated.
In contrast, the dependable diuresis produced by the organomercurials—resulting from enzyme inhibition localized in the kidney—avoids these extrarenal effects.

TABLET
NEOHYDRIN®
BRAND OF CHLORMERODRIN (18.3 MG. OF 3-CHLOROMERCURI-2-METHOXY-PROPYLUREA EQUIVALENT TO 10 MG. OF NON-IONIC MERCURY IN EACH TABLET)

a standard for initial control of severe failure

MERCUHYDRIN® SODIUM
BRAND OF MERALLURIDE INJECTION

LAKESIDE

02656

Combined for a

on

resistant

new

METRETON *tablets*

METICORTEN (PREDNISONE) PLUS CHLOR-TRIMETON WITH ASCORBIC ACID

For prompt and effective relief, especially in many resistant allergic disorders, METRETON affords the benefits of two established agents with unexcelled anti-inflammatory, anti-allergic and antipruritic effectiveness. ***supported by essential vitamin C***—for stress support and for postulated effect on prolonging steroid action ***no better corticosteroid***—original brand of prednisone...minimal electrolyte effects—METICORTEN ***no better antihistamine***—unexcelled in potency and freedom from side effects—CHLOR-TRIMETON effective against hay fever, pollen asthma, perennial rhinitis, acute and chronic urticaria, angioneurotic edema, drug reactions, inflammatory and allergic eye disorders, pruritic and contact dermatoses.

formula: Each tablet of METRETON provides 2.5 mg. of METICORTEN (prednisone), 2 mg. of CHLOR-TRIMETON maleate (chlorprophenpyridamine maleate), and 75 mg. ascorbic acid.

supplied: METRETON Tablets, bottles of 30 and 100.

frontal attack

allergies

new

ETRETON *nasal spray*

ICORTELONE (PREDNISOLONE) PLUS CHLOR-TRIMETON

ickly clears nasal passages • avoids rebound engorgement and npathomimetic side effects • safe even for cardiacs, hypertenes, children, pregnant patients •

position: Contains 2 mg. (0.2%) METICORTELONE acetate (prednisolone ace) and 3 mg. (0.3%) of CHLOR-TRIMETON gluconate (chlorprophenpyridamine conate) in each cc.

kaging: 15 cc. plastic "squeeze" bottle, box of 1.

RETON,* brand of corticoid-antihistamine compound; METICORTEN,* brand of prednisone; ICORTELONE,® brand of prednisolone; CHLOR-TRIMETON,® brand of chlorprophenpyridamine arations. *T.M.

MT-J-576

Schering

Schering
METRETON
NASAL SPRAY
SCHERING
Schering
METRETON
TABLETS
SCHERING

Sedatives
- A.) hypothalamic
  - Reserpine
- B.) cortical
  - Mebaral

A.) Indications
1. Emotional instability
2. Anxiety
3. Tension states
   - a.) Premenstrual
   - b.) Menopausal
   - c.) etc.

B.) Treatment - Tranquilize!

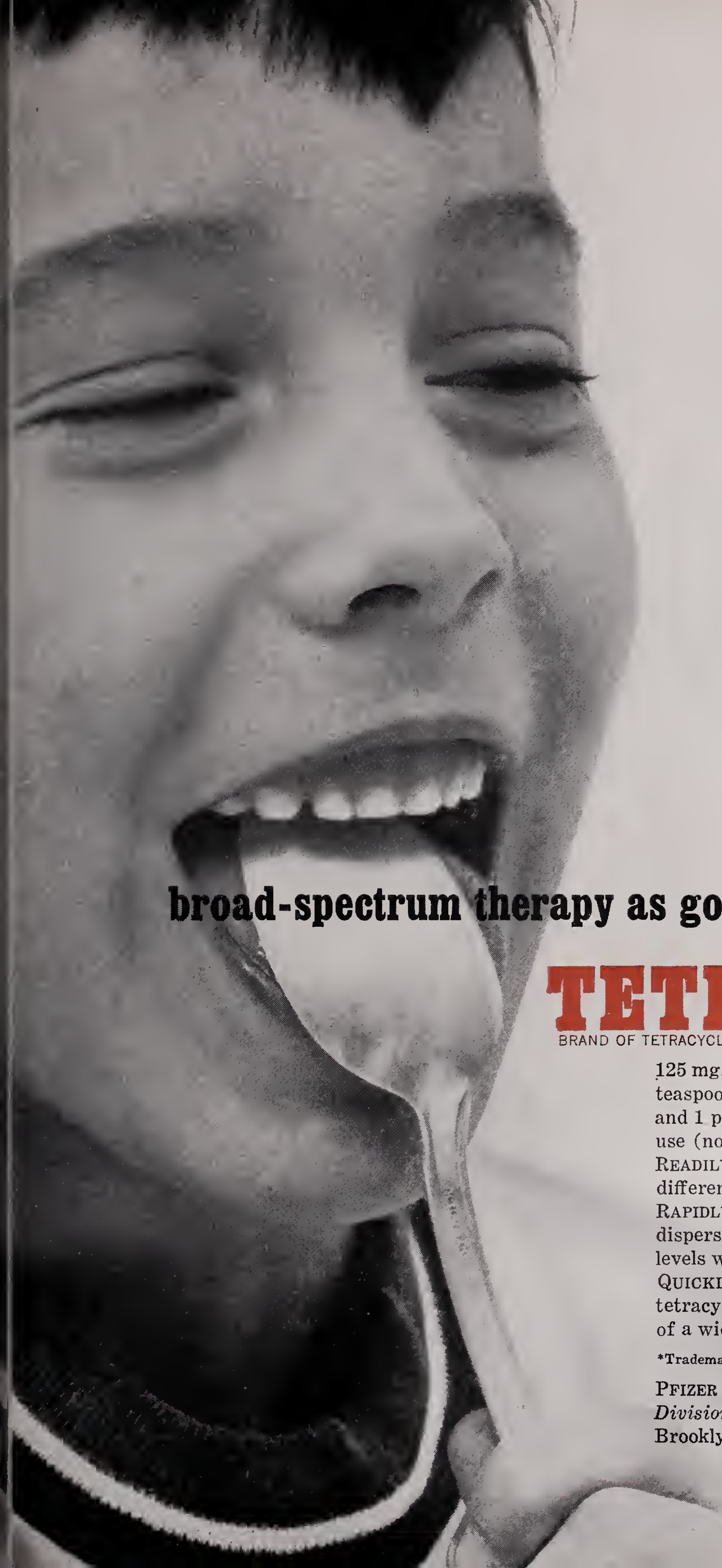
℞

Reserpine c̄ Mebaral
Tablets

usual dose: 1 tab. tid.

Winthrop

Each tablet contains
Reserpine - 0.15 mg.
Mebaral® - 30 mg.
(brand of mephobarbital)



broad-spectrum therapy as good as it tastes!

TETRABON*

BRAND OF TETRACYCLINE **HOMOGENIZED MIXTURE**

125 mg. tetracycline per 5 cc. teaspoonful. Bottles of 2 fl. oz. and 1 pint, packaged ready to use (no reconstitution required). READILY ACCEPTED delightfully different fruit flavor . . . RAPIDLY ABSORBED fine particle dispersion—therapeutic blood levels within one hour . . . QUICKLY EFFECTIVE well-tolerated tetracycline for prompt control of a wide range of infections.

*Trademark

PFIZER LABORATORIES
Division, Chas. Pfizer & Co., Inc.
Brooklyn 6, N.Y.

Pfizer

Q: *In x-ray equipment what will $4950 buy?*

A: This new G-E PATRICIAN

complete with 200-ma control and transformer

YOURS . . . General Electric quality . . . complete diagnostic x-ray unit with tilt table . . . combined facilities for fluoroscopy and radiography—all for just $4950, f.o.b. Milwaukee, U.S.A.

New PATRICIAN gives you 81-inch angulating table . . . independent tubestand with choice of floor-to-ceiling or platform mounting . . . 200-ma, 100-kvp, full-wave transformer and control . . . double-focus, rotating-anode tube.

Also, you get counterbalanced automatic Bucky, plus fluoroscopic screen that's also counterbalanced, self-retaining in all table positions. You can take cross-table and stereo views. Focal-film distances range up to a full 40 inches at any table angle . . . as great as 48 inches cross-table.

The new PATRICIAN can be yours on liberal purchase terms . . . or can be leased under the popular G-E Maxiservice® *rental* plan. Ask your General Electric x-ray representative for all the facts.

Progress Is Our Most Important Product

GENERAL ELECTRIC

Direct Factory Branches:
MINNEAPOLIS — 808 Nicollet Avenue
DULUTH — 928 East 2nd Street

Resident Representatives:
MANKATO — J. F. Van Osdell, 123 Blue Earth
ST. PAUL — R. H. Holen, 153 W. Robie
SIOUX FALLS — H. L. Norlin, 1908 S. Sixth Street

ORAL PENICILLIN
FOR *BETTER*
AND *MORE CONSISTENT* ABSORPTION

"Because of the better and more consistent absorption of penicillin V from the intestinal tract, it would appear that this type of penicillin is preferable to penicillin G when oral administration is to be used."[1]

PEN•VEE•*Oral* and PEN•VEE *Suspension* permit new dependability in oral-penicillin therapy—dependable stability in gastric acid, dependable and optimal absorption in the duodenum. "Not being destroyed by acid in the stomach, as is penicillin G, penicillin V remains available in larger amounts for absorption."[1]

1. Martin, W. J., et al.: J.A.M.A. *160*:928 (March 17) 1956.

PEN·VEE* *Oral* and *Suspension*

PEN•VEE•*Oral* is Penicillin V, Crystallin[illegible] henoxymethyl Penicillin)
PEN•VEE *Suspension* is Benzathine Penic[illegible]n V Oral Suspension

Trademark

Wyeth®
Philadelphia 1, Pa.

magnified potency

with Meti-steroid

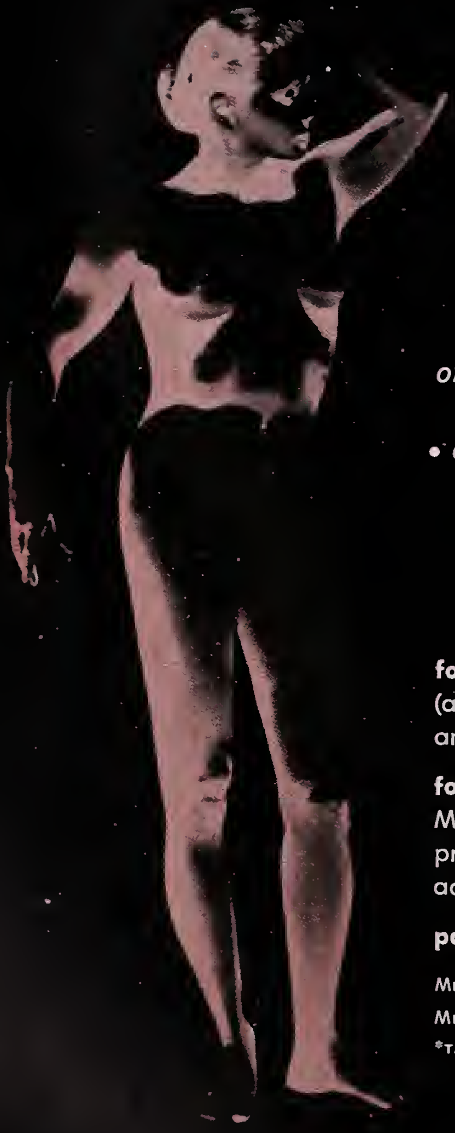
effectiveness in allergic

and inflammatory dermatoses

new

Meti-Derm cream 0.5%

with Meticortelone, original brand of prednisolone



- *approximately twice the per milligram anti-inflammatory activity of topical hydrocortisone*
- *cosmetically acceptable*
- *water-washable*

for effective local relief of allergic (atopic and contact) dermatoses, nonspecific anogenital pruritus.

formula: Each gram of water-washable Meti-Derm Cream contains 5 mg. (0.5%) of prednisolone, free alcohol, in a cosmetically acceptable base.

packaging: Meti-Derm Cream, 0.5%, 10 Gm. tube.

Meti-Derm,* brand of prednisolone topical.
Meticortelone,® brand of prednisolone.
*T.M.

...and adding dual control

to Meti-steroid skin therapy—

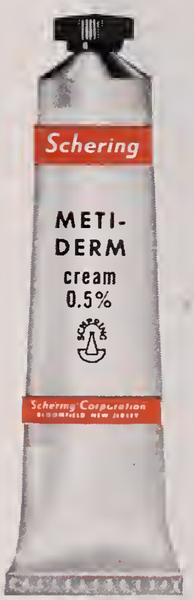
protection

against infection

new

Meti-Derm ointment

with Neomycin


Schering
METI-
DERM
cream
0.5%
Schering Corporation
Bloomfield New Jersey

enhanced effectiveness

in allergic, inflammatory

dermatoses when

minor infection

is present

or anticipated

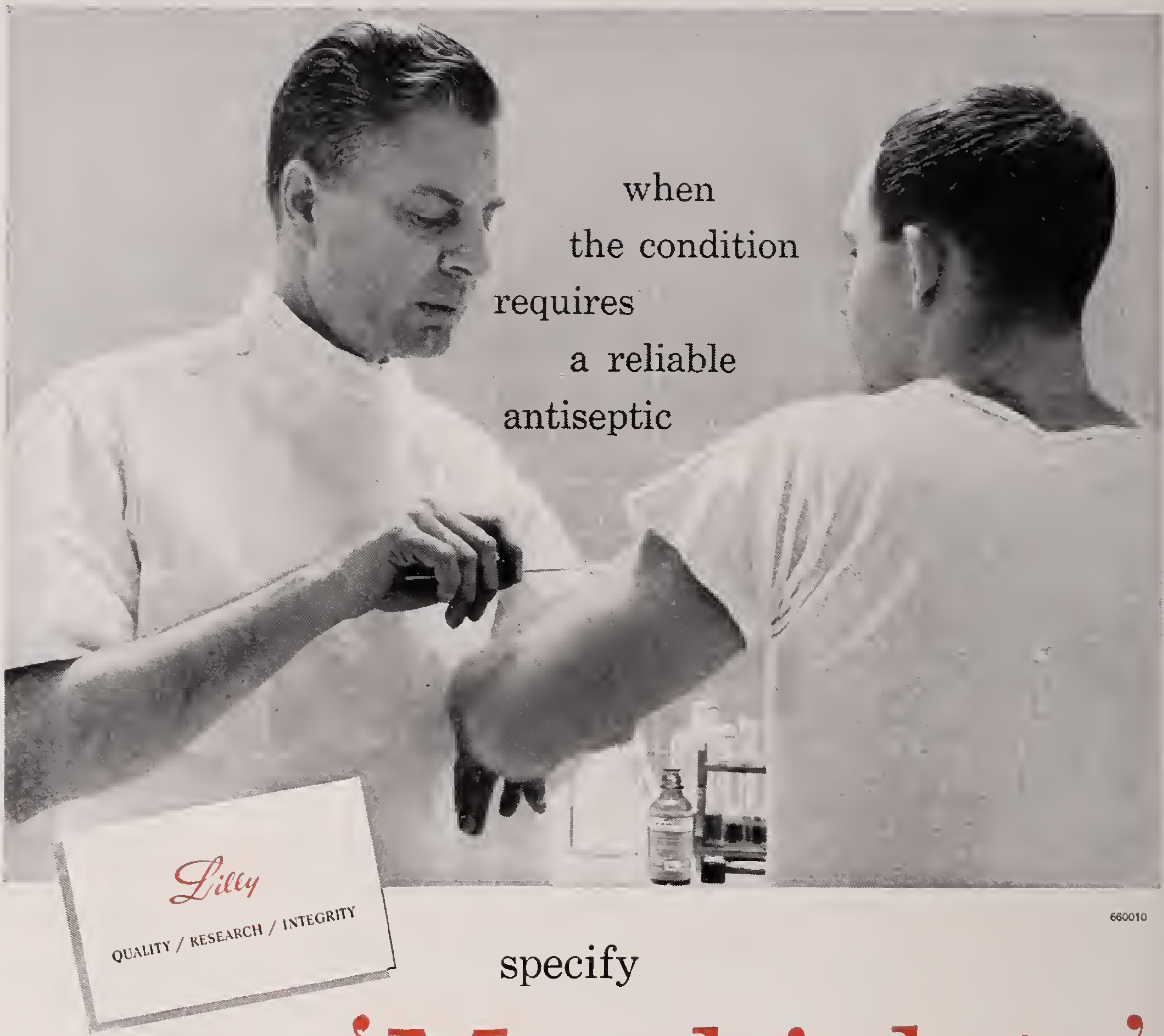
neomycin in addition to prednisolone, free alcohol —for protective coverage against virtually all pathogenic skin bacteria with a well-tolerated, *topical* antibiotic.

formula: Each gram of METI-DERM Ointment with Neomycin contains 5 mg. (0.5%) prednisolone, and 5 mg. (0.5%) neomycin sulfate equivalent to 3.5 mg. neomycin base.

packaging: METI-DERM Ointment with Neomycin, 10 Gm. tube.

Schering

MD-J-656


when
the condition
requires
a reliable
antiseptic
Lilly
QUALITY / RESEARCH / INTEGRITY
660010

specify

'Merthiolate'

(THIMEROSAL, LILLY)

'Merthiolate' is highly active under virtually all conditions; is relatively nonirritating and nontoxic

'Merthiolate' is germicidal in dilutions up to 1:4,000 in serum media and is relatively nonirritating in the concentrations suggested for use. It also maintains its activity in the presence of soaps. The fact that 'Merthiolate' is used as a bacteriostatic agent in fluids for parenteral administration gives strong evidence of its safety.

80TH ANNIVERSARY 1876 · 1956 / ELI LILLY AND COMPANY

The Patient Who Won't Get Well

DONALD W. HASTINGS, M.D.
Minneapolis, Minnesota

SOME day an archeologist digging in the ashes of a long forgotten city of yesteryear may come across the tablets which made up the medical school library in the university of that city. I feel sure that among these ancient records would be accounts of the kind of patient we will talk about today. Psychoneurosis is as old as the human race in all probability, and it is one form of neurotic personality disorder that occurs in the patient who won't get well. Ever since there have been sick human beings and medicine men to look after them, this group of patients has been, I suspect, most difficult for the physician to understand, quite often difficult to the point of impossibility.

The group of patients who demonstrate this neurotic opposition to recovery is not large. This is fortunate, because if such problems were frequent, the satisfactions and gratifications of practicing medicine would suffer thereby. Most of us, I believe, carry the heavy responsibilities of being physicians aided by the support and satisfactions we gain in seeing our patients improve and recover. The patient who does not make the grade understandably defeats us. When we sense that the patient himself, and not some incurable physical disease, is the source of defeat, we feel resentful and angry. This is true of psychiatrists and general physicians alike, I would add. To keep perspective, the group of patients up for discussion is small; the worry and concern of the physician about them is large.

This patient usually presents herself (I use the feminine gender advisedly, since in my own experience most of the patients have been women) to the doctor with a number of physical complaints, and the symptom of overwhelming fatigue is usually among them. The attitude of the patient is that of the sufferer who has borne her heavy load with great courage and fortitude; although the condition has been a part of her for years, she has the acute expectancy of finding a cure speedily at the hands of the new doctor. I speak of the new doctor because the patient will ordinarily have seen quite a number of physicians if they are available. Another feature that is evident if watched for is the large measure of hostility and anger, usually expressed indirectly and with a smile, that this patient carries.

For the first week or two, whatever the diagnostic studies done and treatment given, this patient gets somewhat better, and the doctor and patient are much encouraged. This can be called the stage of "seduction." At this point the unwary physician is getting into an intellectual tar pit, believing that he has succeeded where many have failed. Then, regardless of treatment employed, symptoms begin to return and the road begins to get rocky. What has a few days before seemed like such a happy outcome now is turning sour. The physician, if he has been therapeutically seduced, will not understand it. Things grow slowly worse. The complaints increase in area and depth, the patient is crippled, the family is upset, and so is the doctor. He cannot find anything of enough importance pathologically to account for all the symptoms.

At about this point the patient begins to show an uncanny ability to make the doctor feel as if it were all his fault somehow, and the screw is given another turn. The physician is in a particularly difficult position if he has performed an exploratory laparotomy because of the patient's abdominal complaints. Although he found nothing in the belly, lo and behold, the patient has felt fine for the first week or so post-operatively. The doctor is, of course, pleased that he has been of help even though in his own thoughts he is

---

Read at the annual meeting of the Minnesota State Medical Association, Rochester, Minnesota, May 22, 1956.

From the University of Minnesota, Minneapolis, Minnesota.

profoundly puzzled that an exploratory laparotomy with normal findings has helped the sufferer.

Then a day or two before discharge from the hospital, there begins a fleeting abdominal symptom or two. By the time the date of discharge arrives, the patient is not very well and the surgeon is worried. He knows the belly was all right when he was inside of it two weeks previously. "Are the symptoms due to something I did," thinks the surgeon. "After all, she was without any symptoms for a good ten days. Are these symptoms due to adhesions caused by the surgery?" If this thought is annoying enough and the patient and her family desperate enough, the physician may go back for another look, or more likely another doctor will. This is the patient who may have several scars on her abdomen—perhaps three or four.

One brief case history may be illustrative. Several years ago a woman in her late thirties was referred to the hospital by her family doctor. He had called the psychiatric service because he had correctly diagnosed a serious emotional problem even though his patient had only physical complaints: overwhelming fatigue, headache, abdominal cramps, and a host of minor symptoms. The understandable frustration of the doctor was carried in his recommendation that after psychiatric study he imagined we would want to send her to a state hospital. "She's been a burden to her family and everybody up here, and she would be better off in a state hospital," were his words.

What kind of monster was this woman? She was a small, wiry, immaculately dressed woman who weighed 97 pounds. When she sat down in the office, although she said she was exhausted, she was the picture of health and graciousness. Her conversation went something like this: "I'm so grateful that a busy man like you is willing to take the time to see me, and I know you can help me. It's discouraging to go to doctors all the time and get nowhere. They do their best; they don't really understand how I suffer. I can tell that you understand and I feel better already. It's so nice such a busy person is willing to see me. The last time I was at 'X' clinic, it was terrible. The doctor I had spent a few minutes with me each day. How could he tell me that my heart was all right when he hardly knew me? That's the trouble with that clinic—you're just a number. I'm so exhausted and won't be able to talk much longer. I've heard such good things of the University. Isn't Doctor X, the famous surgeon, at this hospital? You're a psychiatrist, aren't you? How do you stand it all day long just listening to people complain and talking to them? You must be a very well balanced person, and if I ever really need a psychiatrist, I would certainly like to have you. It's too bad all doctors aren't like you. Most doctors are really quite ignorant and don't seem to care much how their patients feel. I imagine that's why people don't think as much of doctors as they used to."

I believe this is a reasonably accurate verbatim account of the first few minutes I spent with this patient. None of you will fail to see how hostile and attacking this woman was. When such a patient attacks doctors in general, she is of course attacking the physician in front of her. When this happens, even though the patient seems unctuous with the doctor at hand, it is not hard to visualize what she will tell the next doctor about this one.

Before leaving this patient, let me tell you of one other typical and revealing experience I had with her. I had been seeing her about three weeks. She had done quite well for the first week or ten days, then began to go downhill. On this particular occasion she pointed out that she was somewhat worse than when she came. She said, "You're very nice. You are an excellent doctor. It's too bad I'm getting sicker."

Sooner or later, although not always, the physician senses he is up against a very respectable opponent. He intuitively begins to realize that the patient is determined to hang on to every symptom; to carry on guerilla warfare; to find the weak spots and exploit them; and all in all to demoralize the doctor and his doctoring, all the time suffering and remaining extremely miserable. But patients do not play such bruising games without reason, and I shall return to this in a moment.

The result of this particular kind of Doctor's Dilemma usually ends up in one of these ways:

1. The doctor is trapped. He makes frequent house calls, particularly in the dead of night, often summoned by a frantic and panicky husband, to give some life-saving sedative so the patient can get a few hours' sleep and struggle through the morrow. The doctor in the recesses of his own mind is puzzled by the whole affair and is fearful that the patient is becoming addicted to sedatives.

2. The physician abandons the ship. He either sends the patient on a cruise which solves things for several months, or if he is lucky, he can get some other doctor to take her over. If he is in a big city, this can be a psychiatrist.

3. He takes the bull by the horns, sets definite limits, and the patient and doctor both begin to feel more comfortable. I shall also return to this in a moment.

I hope I have not conveyed the impression that a patient of this sort cannot be handled by a general physician, because it is possible. It is, however, important that the physician recognize this patient, diagnose her correctly, have some idea of why she is reacting in these ways, and have some knowledge of treating her. Before going into these matters, let me point out one important aspect of this type of situation. This has to do with the doctor in his relations with other doctors. This type of patient degrades former physicians and flatters the one in front of her. She often will tell neighbors and others that Doctor So-and-So down the block is not entirely competent, or that patients are treated badly at the Such-and-Such Clinic or at the University, et cetera. This is a fertile breeding ground for misunderstandings between doctors and emphasizes their need for good communication with each other about patients. This patient has an uncanny ability to exploit little things the doctor says or leaves unsaid. There is no doubt that an extra degree of caution is in order with respect to casual remarks, lest misunderstandings occur.

Let us return to the three aspects I mentioned before: diagnosis, the reasons behind the neurotic behavior, and treatment. Diagnosis depends on two sets of data. The first is an accurate medical history. The numerous complaints, including fatigue, the duration of illness, the number of doctors seen, and sometimes the number of major operations without real indication give pointed clues to the diagnosis. Secondly the attitudes of the patient are important: the way in which she tells her story, her tendency to run down previous doctors and to flatter the one in front of her.

The neurotic mechanisms operative behind the symptoms and behavior are several. The hostile dependent quality (both the hostility and the sticky dependency are marked) is often regarded as deriving from a strict, rigid childhood background in which the child was made fearful of displeasing anyone, but made angry by such rigid limits; however, the anger could never be openly expressed lest the child be punished further. The child learns that the best way to meet life is to be nice to everyone one meets even if one hates them; that any anger must be expressed indirectly or the fault made to lie elsewhere; that there are gratifications in seeing the strong people who punish one made to feel helpless and without power; that one must never get too close to anyone lest he get hurt by being close; that to love anyone maturely is too great a risk.

In many ways, strange as it seems, perhaps the most mature relationship this patient ever makes with anyone is with the doctor. She can pay a fee for the dependency she feels and hence has some measure of control over it. In turn, she can sense some security in feeling that a parent-like figure, the doctor, wants to help. Every relation is tested in many ways; and when the doctor gives up or becomes angry with her, her old childhood self, upon being rejected again in this way, says, "I told you so—people always treat you this way. Don't trust them." That the patient is no longer a child and the doctor is not a real parent are factors which cause this to be termed neurotic behavior.

Based on such understanding, the role of the physician becomes more clear although not necessarily less difficult. He will seek to be a kindly but firm parent who can be respected. He will protect the patient from her own hostile aggressive impulses and will not be visibly upset either by her seductive behavior or by her anger. His attitude will be one of wanting to help within the definite limits he sets, for example, seeing the patient every other week for twenty minutes but not oftener. He will be of help to her by not giving medication, particularly sedatives, simply because she asks for it and by giving her an opportunity gradually to talk about herself instead of symptoms. To be this trustful takes a long time. When such a patient at long last begins to break down by showing some feeling and by talking seriously and from the heart about personal problems, the doctor can afford a sigh of relief in the knowledge that he has helped another human being break the egg shell of emotional infancy.

Reconstruction of Major Blood Vessels Employing Artery Homografts

FREDERICK M. OWENS, JR., M.D.
Saint Paul, Minnesota

THE need for suitable blood vessel grafts has existed for many years but only recently have technical advances been such that it has been possible to employ grafts on a widespread clinical scale. For such advances we are indebted to Carrell,[1,2] Gross,[3] Hufnagel,[4] DeBakey,[5,6] Blakemore[7] and many others.[8,9,10,11] The major efforts in vessel replacement have been in the use of vein or artery homografts, but because of the difficulty of obtaining suitable donor material increasing interest has been shown in the use of various plastic substitutes for blood vessels.

The need for grafts is seen most frequently in arteriosclerosis for the replacement of segments of large vessels involved by aneurysms or thrombotic occlusion. Some congenital anomalies such as aortic coarctation demand the use of vessel grafts for suitable correction of the defect. Trauma and tumors involving large vessels play a small but significant role in the need for blood vessel grafts. The success of the graft is directly proportional to the diameter of the vessel replaced, for in smaller grafts the incidence of thrombosis is increased.

Early attempts to graft blood vessels were made using vessels taken at autopsy under sterile conditions and preserved for a short time by refrigeration. This method proved to be cumbersome and unreliable for the specimen could be kept for only three or four weeks before degeneration progressed to a point where the grafts became soft and weak. Rupture of overage grafts has been reported.[12] Freezing of grafts with such agents as carbon dioxide or liquid nitrogen allowed for prolonged preservation. These grafts were found to function about as well as the fresh grafts. However, storage at the low temperature requires costly equipment and constant attention to the maintenance of freezing temperatures. Lyophilization of the grafts made it possible to keep the specimen at room temperature for an indefinite period of time. Subsequently sterilizing solutions such as ethylene oxide and beta propiolactone obviated the need for taking the grafts under sterile conditions for these substances will effectively sterilize blood vessel grafts without changing their characteristics.

The need for grafts has surpassed the supply; therefore, many investigators are studying various plastic materials in an attempt to find substances from which to fashion satisfactory prostheses for blood vessel replacement. This search for vessel substitutes is not new for attempts have been made in the past to use tubes of glass, aluminum, silver lined with paraffin and gold plate. These were uniformly unsuccessful. In the past two years extensive study of new plastic materials has revealed that numerous materials can apparently be used. Blakemore[13] and Voorhees have worked with vinyon-N. Hufnagel[14] and others have worked with orlon. Schumacher[15] tried nylon while others have used fiberglas, dacron and many varieties of these cloths. Lewis[16] has been experimenting with tubes fashioned from Ivalon sponge. These tubes are easily made and can be handled much more readily than the other prosthetic materials. The material sews very much like the adjacent vessel and holds the sutures well. Early studies indicate that it is satisfactory material for vessel substitution.

The grafts which we are to present here are all homografts but the mode of preparation and preservation differs in each case. We have chosen three patients to illustrate the value of blood vessel grafts emphasizing the importance of the assistance of other doctors in obtaining suitable blood vessels at autopsy.

The first patient is N.K., a forty-eight-year-old bartender who was seen in May, 1954, complaining of cramping pains in the calves of the legs for three months. His feet constantly felt cold and with the slightest exertion he had pain in the lower back, hips and thighs. Impotence had been progressive for several months. Examination revealed absent pulses in both lower extremities and only faint aortic pulsation in the abdomen. May 12, 1954, aortography (Fig. 1, *left)* revealed severe occlusive disease of the distal aorta. On May 24, 1954, a right lumbar sympathectomy was carried out because of increasing pain in the right thigh and because no suitable graft was available. Resection of the distal aorta and proximal iliac arteries was effected on June 18, 1954. The right hypogastric artery was ligated because it was severely diseased and an aortic Y graft was inserted for reconstruction of the defect as shown in (Fig. 1, *right).* The patient was discharged from the hospital, June 26, 1954, with good dorsal pedal, posterior tibial, popliteal and femoral pulses bilaterally. The patient walked without pain at discharge and is engaged in a full time job which he conducts without difficulty. When seen on November 4, 1955, examination revealed that there was no longer a pulse in the right leg. Oscillometry at the left calf was 2.5, at the right calf it was 0. The patient has had pain in the right leg with walking for about one month. The examination indicates an extension of his thrombotic process. Whether this began primarily in the graft or in already diseased vessels is difficult to say, but the probability is that the process began in diseased vessels distal to the graft.

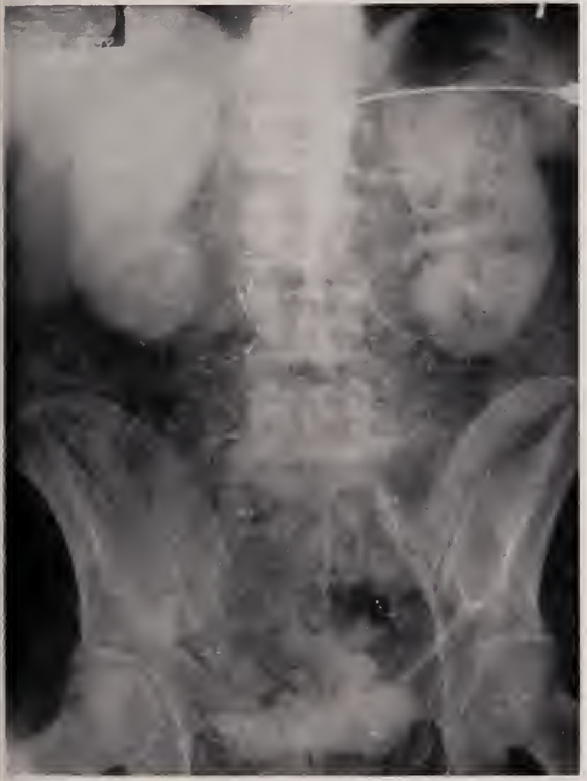


Fig. 2a. Aortagram in Case 2.

The second case is that of I. D., a fifty-two-year-old railroad cook, who was seen first in November, 1953, complaining of inability to walk more than half a block before getting severe cramps in the right leg. His symptoms were of four years' duration. He also had night cramps in both legs, low back pain and pain in the hips with exertion. Impotence had been progressive over the previous four years. The feet were constantly cold. Examination revealed absent femoral, dorsal pedal and posterior tibial pulses bilaterally. Dependent rubor was three plus.

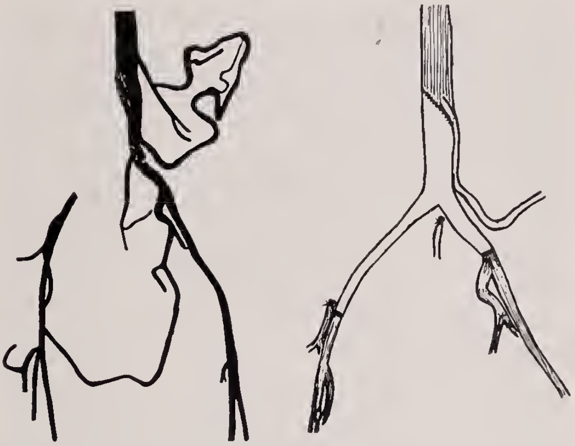


Fig. 1. *(left)* Reproduction of aortagram in Case 1. *(right)* Extent of graft replacement in Case 1.

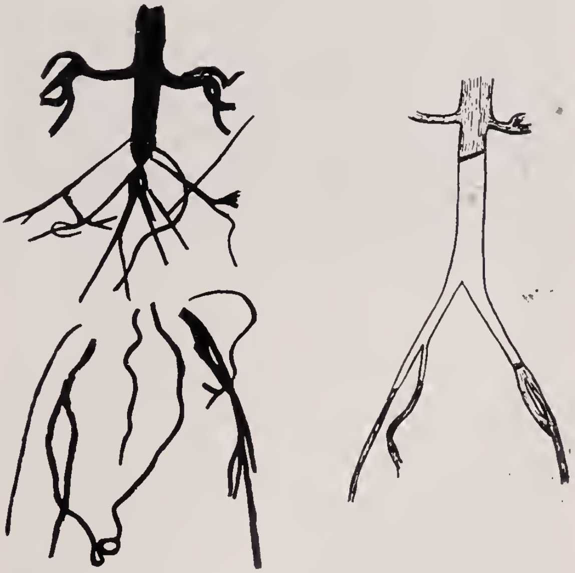


Fig. 2b. *(left)* Schematic reproduction of aortagram, Case 2. *(right)* Graft replacement in Case 2.

Right lumbar sympathectomy was carried out November 5, 1954, without significant improvement. Aortography revealed complete occlusion of the distal aorta with patent distal vessels, (Fig. 2a and 2b, *(left).* January 3, 1955, the aorta was replaced by a Y graft, (Fig. 2b, *right).* Postoperatively the femoral, posterior tibial and dorsal pedal pulses were excellent. The legs were warm and the color was good. The patient was discharged from the hospital on February 10, 1955. At present the patient states that he can walk five miles without having his legs tire. He also states that his impotence is improved. Oscillometry before operation was without response while at present the readings at the calf are 3.5 points. The patient has resumed work as a railroad cook which duty requires his working fourteen to sixteen hours a day standing on a moving train.

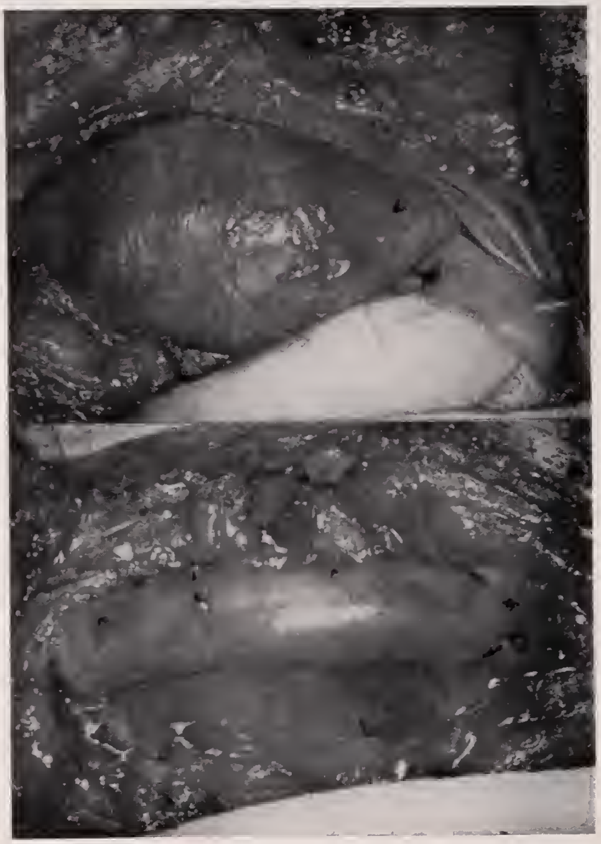


Fig. 3. *(above)*. Left femoral aneurysm. Case 3. *(below)*. Graft replacing common femoral artery, Case 3.

The third patient, B. A., a sixty-four-year-old salesman, was seen March 19, 1955, complaining of sudden numbness, coldness, paleness of the right leg with severe pain in the extremity. For three years he had noted increasingly severe intermittent claudication of both legs. Examination revealed absent popliteal, posterior tibial and dorsal pedal pulses on the right. The left popliteal pulse was present but posterior tibial and dorsal pedal pulses were absent on the left. Diagnosis of the thrombosis of the right superficial femoral artery was made and exploration of the vessel was carried out with the intention of doing an endarterectomy. Three aneurysms in a severely diseased artery were found and no repair could be effected; therefore, right lumbar sympathectomy was performed and the response was excellent. On May 3, 1955, the patient was again admitted to the hospital because of a large, painful mass in the left groin, and resection of a large aneurysm of the left common femoral artery was carried out on May 5, 1955 (Fig. 3, *above)*. The defect was replaced by a Y graft connecting the external iliac artery to the superficial femoral and to the deep femoral arteries (Fig. 3, *below)*. The response was excellent and the patient was relieved of pain in the left leg as well as the groin. He was again admitted to the hospital on August 11, 1955, because of an enlarging mass in the right groin and severe pain in the right groin and thigh. Resection of a large aneurysm of the right common femoral artery was carried out. A straight graft was placed between the external iliac and deep femoral arteries. The superficial femoral artery was ligated because it was completely occluded by old thrombus. The patient was discharged markedly improved but is forced to limit his activity because of pain in the right leg after walking two blocks.

These three patients illustrate the use of grafts preserved by various methods. The first graft was taken with sterile precautions and was refrigerated in sterile saline solution until it was used ten days later. The second graft was taken without aseptic precautions, was sterilized with beta-propiolactone and was refrigerated in Gross-Hanks solution. The fourth and fifth grafts were taken at routine autopsy, were sterilized with beta-propiolactone, frozen, dried and stored at room temperature. These grafts were reconstituted in saline and inserted after suitable tailoring. To date these grafts are functioning satisfactorily. No postoperative arteriograms have been made, but examination of pulses and check of oscillometry reveals that the grafts are patent. Furthermore the improved functional capacity of the limbs in each case is so striking that there can be little question as to the function of the graft.

At the present time, our grafts are taken at autopsy without sterile precautions. They are examined to make sure that the vessel is free from atherosclerotic changes, the adventitia is removed from the vessel, which is then immersed in about a liter of normal saline solution. One per cent (by weight) of beta-propriolactone is added, and to this enough phenol-red to color the solution. Sodium bicarbonate is added to bring the pH to between seven and eight, as indicated by a red color of the phenol-red indicator. The blood vessel is then incubated for two hours at 37° C. in this solution. Sodium bicarbonate is added as necessary to maintain the proper pH during this period. Finally the aorta is washed in saline and cultured both aerobically and anaerobically.

At this point, the vessel is prepared for short term storage or for long term storage as is deemed necessary. For short term storage (four to six weeks) the vessel is suspended in a plasma fortified polyionic solution (Gross-Hanks) to which one gram of neomycin and one million units of penicillin have been added. The vessel is stored at 20° F. in a sterile container and may be used without further preparation. For long term storage the vessel is blotted of excess water on sterile towels, placed in a sterile 3x30 cm. test tube and immersed for five minutes in a solid carbon dioxide methyl cellosolve mixture at —70° C. The tube with the frozen vessel is attached to a lyophilizing apparatus and subjected to a vacuum of thirty-five microns of mercury for forty-eight to seventy-two hours. The tube is then filled with dried nitrogen and removed from the apparatus, capped with a special rubber sleeve stopper, sealed with glyptal and re-evacuated by means of a needle through the sleeve stopper. The vessel may be kept indefinitely at room temperature. This method has been adapted from the technique of Szilagyi.[17]

It is becoming ever more apparent that plastic substitutes will take the place of homografts and autografts. The ideal plastic has not yet been demonstrated but it should be (1) readily available, (2) easily constructed in various sizes and shapes, (3) adaptable to operating room sterilization, (4) easily sutured to the adjacent vessel, (5) impervious to blood, (6) "non-wettable" by the blood, and (7) capable of curving rather than kinking, with flexion of joints. As judged by early studies, the plastic substitutes are not as satisfactory as arterial homografts, but there may be some long term advantages. Late degenerative changes, late calcification and late aneurysmal dilatation have been noted in homografts. These changes probably do not occur in the plastic prosthesis although there has not been sufficient long term study to give a satisfactory answer to this question.

Summary

1. Homografts preserved by various means play a prominent part in the treatment of arterial disease.

2. Prosthetic grafts promise to take the place of arterial homografts.

3. Three cases, in which four arterial homografts were used, show the benefits obtained with grafts.

References

1. Carrell, A. J.: Experimental surgery of the aorta. Am. Surg., 42:81, 1910.
2. Carrell, A. J., and Guthrie, C. C.: Uniterminal and biterminal venous transplantation. Surg., Gynec., & Obst., 2:266, 1906.
3. Gross, R. E.; Hurwitt, E. S.; Bill, A. H., Jr.; and Pierce, E. C., II: Preliminary observations on the use of human arterial grafts in the treatment of certain cardiovascular defects. New England J. Med., 239:578, 1948.
4. Hufnagel, C. A.: Blood vessels. Transplantation. Bull., 1:135, 1954.
5. DeBakey, M. E.; Creech, O., Jr.; and Cooley, D. A.: Surgical treatment of aneurysms and occlusive disease of the aorta. Postgrad. Med., 15:120-127, 1954.
6. DeBakey, M. E.; Creech, O., Jr.; and Cooley, D. A.: Occlusive disease of the aorta and its treatment by resection and homograft replacement. Ann. Surgery, 140:290-310, 1954.
7. Blakemore, A. H., and Voorhees, A. G., Jr.: Aneurysm of the aorta: A review of 365 cases. Angiology, 5:209-231, 1954.
8. Schafer, P. W., and Hardin, C. A.: The use of temporary polythene shunts to permit occlusion, resection and frozen homologous graft replacement of vital vessel segments. Surgery, 31:186-199, 1952.
9. Dubost, C.; Allary, M.; and Deconomos, N.: Resection of aneurysm of the abdominal aorta. Arch. Surg., 64:405, 1952.
10. Swan, H.; Robertson, H. T.; and Johnson, M. E.: The fate of preserved aortic grafts in the dog. Surg., Gynec., & Obst., 90:568, 1950.
11. Julian, O. C.; Grove, W. J.; Dye, W. S.; Olwin, J.; and Sadore, M. S.: Direct surgery for arteriosclerosis. Ann. Surg., 138:387-403, 1953.
12. Hamblin, R. G., and Lord, J. W., Jr.: Fatal rupture of preserved aortic homograft. J.A.M.A., 155:1406-1407 (Aug. 14) 1954.
13. Blakemore, A. H., and Voorhees, A. B., Jr.: The use of tubes constructed from vinyon-N cloth in bridging arterial defects. Ann. Surg., 140:324-334, 1954.
14. Hufnagel, C. A.: Panel discussion on substitutes for arterial segments. International Symposium on Cardiovascular Surgery. Philadelphia: W. B. Saunders Co., 1955, p. 501.
15. Schumacher, H. G., Jr.; and King, H.: The use of pliable plastic tubes as aortic substitutes in man. Surg., Gynec., & Obst., 99:287-294, 1954.
16. Lewis, F. J.: Shumway, N. E.; and Gliedman, M. L.: An experimental study of the use of polyvinyl sponge for aortic grafts. Surg., Gynec., & Obst., 100:703-706, 1955.
17. Szilagyi, D. E.; Overhulse, P. R.; and LaGrippo, G. A.: Use of chemically sterilized arterial homografts. Clin. Res. Proc., 2:108, 1954.

The Changing Character of Infections as the Result of the Era of Chemotherapy

F. H. TOP, M.D.
Iowa City, Iowa

PHYSICIANS who practiced in or before the 1930's and are in practice now would readily admit to a change in the character of the common infectious diseases that has taken place during the past twenty-five years. In fact, medical students of today marvel at the change which has taken place since 1940, particularly after reading Geddes Smith's book entitled "Plague on Us" published in 1941.[1] They immediately sense the fact that little is stated concerning sulfonamides and nothing about antibiotics. They infer that changes since 1940 came about entirely or largely because of the so-called "wonder drugs."

Since the beginning of the century there has been a change in the incidence and severity of infectious diseases, and deaths resulting from most of them have decreased in a remarkable manner. On the other hand, heretofore less well known infections such as the rickettsial diseases—Rocky Mountain spotted fever, Q fever and rickettsialpox—have warranted greater attention. The infectious encephalitides have also come to the fore—more specifically, eastern and western encephalomyelitis occurring in the United States and Canada. Upper respiratory infections of a viral nature, other than the common cold and influenza, have recently been discovered. Another example is the appearance of Coxsackie disease, which may give rise to a poliomyelitis-like infection, is responsible for epidemic pleurodynia (Bjornholm's disease) and herpangina.

A cursory look at the reduction in death rates and the lowered incidence or milder form of ordinary childhood diseases now present compared with experience just two decades ago, might lead one to ascribe these changes in their entirety to the advent of sulfonamide and antibiotic therapy. In order to orient oneself with relationship to factors that may have played a part in the changing character of infections, a look at the record is necessary and revealing. In Table I, death rates are given for certain diseases by the time intervals 1900, 1925, and 1950. The data comprise death rates for certain diseases in the U. S. registration area based on deaths per 100,000 of the population. Case rates might have been chosen but would not serve as well as death rates, for there is less chance of quibbling in relation to a death resulting from a specific disease than when consideration is given to inclusion of a case in the same category. The three time intervals chosen for comparison are rather ideal, for the year 1900 saw a beginning decline in cases and deaths from most of the common infectious diseases and the period between 1900 and 1925 can be stated as that period during which environmental sanitation exerted a marked influence on the occurrence of gastrointestinal infections and, as often happens, a reduction in such infections lead to a diminution in other nonenteric infections.

TABLE I. DEATH RATES FOR CERTAIN DISEASES

U. S. Registration Area (Deaths per 100,000 Population)

Disease	1900	1925	1950
Diphtheria	40.3	7.8	0.3
Malaria	6.2	2.0	0.1
Measles	13.3	2.3	0.3
Pneumonia and influenza	202.2	121.7	27.0
Scarlet fever	9.6	2.7	0.2
Tuberculosis	194.4	84.8	22.6
Typhoid fever	31.3	7.8	0.1
Whooping cough	12.2	6.7	0.7

The interval between the year 1925 and 1950 may be termed the era of chemotherapeutic and antibiotic therapy. The table discloses that between the period 1900 and 1925 no rate increases are noted for the diseases listed. Actually, all infections show marked declines, with 1900 rates two to five times greater than those recorded for 1925. Thus, before sulfonamides and antibiotics were available, marked changes had occurred in the number of deaths recorded for the diseases indicated in the table. This phenomenon took place

---

Presented at the annual meeting of the Minnesota State Medical Association, Rochester, Minnesota, May 22, 1956.

during the so-called era of environmental sanitation and of the diseases noted only typhoid fever and malaria would strictly come under this category. Yet upper respiratory infections, such as diphtheria, measles, pneumonia, scarlet fever, tuberculosis and whooping cough, all showed a favorable downward trend in death rates.

During the period 1925 and 1950 sulfonamides and antibiotics were widely used. A comparison of the 1925 death rates with those in 1950 indicates a reduction in the latter year of the magnitude of two to twenty-five times. However, some of the diseases listed in the table are not *per se* amenable to drug therapy. Diphtheria is one such, and the reduction here must be attributed to the use of toxoid for active protection against the disease, among other factors. The decline in malaria can be attributed to the use of antimalarial drugs not included in the sulfonamide or antibiotic group and to institution of antimosquito measures, particularly to the use of agents such as DDT. Measles is an example of death reduction resulting from the control of secondary bacterial invaders which are amenable in part to drug therapy. The remainder of the diseases in the table have been influenced by the use of antibiotic agents but deaths from these infections had also markedly declined in the period 1900-1925.

There is no intention of slighting the value of drug therapy, but one must consider the past in order properly to measure the present. As stated before, environmental sanitation played a large role in the decline in deaths noted between 1900 and 1925. In addition, a consciousness of the importance of personal hygiene became evident around 1910 while rapid strides were being made toward an improved community hygiene. With relation to the period 1925 to 1950, personal and community hygiene continued to exert a marked influence and in addition, an improved economy, a better nutritional state and adequate housing were added factors along with chemotherapeutic and antibiotic agents in causing a reduction in mortality rates.

Before proceeding further with the discussion of the changing character of infections, it might be well to define the term infection. Infection is the interaction between a host and a parasite in an environment common to both, and this can be written as an equation namely, infection = host + parasite + environment. All three of the mentioned components are necessary to the production of infection. Absence of one makes it impossible for infection to occur. None of the three components is *most* important in the equation, but there is an indication that for a particular set of circumstances one may be *more* important than the other.

Changing infections are the result of natural host-parasite relationships in which there is an absence of interference by man resulting in a normal rise and fall in disease incidence and secondly, by a non-natural, host-parasite relationship in which there is human host interference in an attempt to eliminate the parasite or its transmitters (vectors). There are certain factors affecting each of the components of infection. With relation to the *host* the following factors are of importance: personal hygiene, the economic status of the individual, the possibility of improved nutrition because of the better economic state, increased natural resistance and agents for prevention and treatment of disease. *Parasite* factors are contingent upon the virulence of the organism, on the quality and number of the reservoirs harboring the parasite and on vectors, which make transfer of the organism from host to host possible. *Environmental* factors are bound up with community hygiene, particularly with relation to the purity of water and foods and with facilities for disposal of sewage and wastes. Housing is another important factor in this category. With relation to all three components the factors cited are perhaps the more important, but there are others that have not been mentioned.

Having set the stage, so to speak, by showing multiple causation for changes in death rates that have occurred since 1900, let us consider the effect that chemotherapeutic agents and antibiotics have had on the changing character of infections. The evidence for an effect appears obvious for diseases in which the causative organisms are sensitive to antibiotics. For example, there has been a lowered incidence of syphilis and a decline in death rates attributable to tuberculosis. However, a change in character has been noted also in infections for which the causative organisms have been more or less resistant to antibiotics. Changes have been due to recalcitrant infections such as *S. aureus,* certain Gram-negative bacilli and tuberculosis. Secondly, changes have been due to superinfection, which is the result of replacement of antibiotic sensitive bacterial flora by a different species of organism resistant to the antibiotic being used. Monilia, proteus, and pyocyaneus infections and staphylococcal enteritis serve as examples.

Recalcitrant infections and superinfections are the result of resistance of organisms to antibiotics. The origin of resistance is supposed to be twofold namely, genetic, by transfer of a Mendelian characteristic or secondly, by physiologic adaptation, the drug inducing resistance biochemically. Information on the origin of resistance is incomplete for it is difficult to devise crucial tests or to determine cause and effect, because the drug is required to test resistant cells. The reasons for resistance are also unknown, for there have been few investigations on metabolic changes accompanying acquisition of resistance. From studies reported thus far, it is logical to assume that (1) bacteria change their enzyme systems; (2) the growth medium influences the adjustment; (3) antibiotic inactivators such as penicillinase are present in micrococcus or *S. aureus* infections, and a chloramphenicol-reducing enzyme is produced by some strains of micrococcus; and (4) antibiotics may be stimulators of bacterial growth as shown by Garrod.[2] The Arndt-Schulz law which states that weak stimuli increase physiologic activity and very strong stimuli inhibit or abolish activity may apply to antimicrobial drugs: for example, a penicillin concentration of 0.004 units per ml. is a stimulant for *S. aureus,* while a penicillin concentration of 4 units per ml. enhances the growth of *Pseudomonas aeruginosa.*[3]

From the therapeutic standpoint, resistance to antibiotics is probably the result of the operation of one or more of the following factors: first, unwise choice of an antibiotic—the organism not being sensitive; second, the misuse of an antibiotic, by long continuance of a slightly effective drug; third, by prolonged uninterrupted prophylaxis, which is generally futile, an economic waste and often detrimental; and finally by use of combinations which may antagonize. The antibiotics may be divided roughly into those which are bactericidal and those which are bacteriostatic. In the bactericidal group are penicillin, streptomycin, bacitracin, and neomycin, while in the bacteriostatic group are chlortetracycline, chloramphenicol, oxytetracycline and tetracycline. The use of one or more drugs in the bactericidal group with a drug in the bacteriostatic group may result in antagonism rather than synergism.

Infection as a Biologic Phenomenon

A more important and more fundamental reason for a change in the character of infections may be that infection is a biologic phenomenon. A proper perspective demands consideration of the term ecology. Ecology is the relationship between various living organisms in an environment and of their reactions to their animate and inanimate surroundings. Human ecology is the study of the whole of man's habits and modes of life and his relations with his surroundings. Ecology denotes the close relationship between all living things and in considering the definition for infection we find that the host-parasite relationship is an ecologic phenomenon. Now, the host-parasite relationship may result in inapparent or subclinical infection, apparent or clinically recognizable infection (disease) and death. As medically trained individuals we have looked upon the disease and death components of infection as particularly undesirable. Actually, the host-parasite relationship results in disease and death only occasionally and the factor of inapparent infection is by and large more important, for in this situation the adjustment of host and parasite has not been inimical, but valuable; nearly always inapparent infection results in protection of the human host against severe disease or death.

In thinking of certain wild animals, predation is called to mind, a preying of one animal upon another. This can hardly be stated of the host-parasite relationship; however, it is an example of parasitism and we can readily substitute the word parasitism for the word infection in the equation infection = host + parasite + environment. Looking upon parasitism or infection from the standpoint of the parasite, it must be immediately obvious that survival of the parasite is dependent upon the well-being of the host. If the host is critically ill, it will be to the detriment of the parasite and if the host dies the parasite will likely die. Thus, in terms of the parasite, disease and death are evidences of a bungling parasitism. The relationship which is optimal to both host and parasite is commensalism—a mutual but almost inconsequential association between a parasite and its host.

In 1869, Van Beneden[4] wrote a book entitled "Animal Parasites and Messmates" and Vaughan[5] over thirty years ago used the word syssitic (to eat together) to describe the host-parasite relationship. Smith[6] elaborated on this concept in

1934 in his book entitled "Parasitism and Disease." A messmate is a person with whom one sits down to eat, and Van Beneden looked upon the host-parasite relationship as such an association. As good an example as any is the relationship between the colon bacillus and man, the former being present in the gastrointestinal tract of man shortly after birth and remaining with him until death. The colon bacillus rarely causes disease in man, but generally influences the environment in the gastrointestinal tract to such an extent that by sheer numbers it displaces most of the organisms that might be pathogenic. The bacillus also aids in the synthesis of vitamins. Commensalism is the host-parasite relationship which is constantly striven for in nature.

Now, prophylaxis and treatment accorded the human host is interference with normal host-parasite relationships and leads to change in the character of infections. Martí-Ibañez[7] states, "Because antibiotics intervene at the most subtle phases of metabolism and in the most delicate enzymatic actions of bacterial life, they provoke changes in the bacteria's biological cycle which have already been translated into radical changes in the diseases they cause." Nature tends to preserve species and, in the biologic sense, organisms as species may be as important as human beings. The use of antigens and prophylactic or therapeutic agents destroys or makes difficult the host-parasite relationship, and from the standpoint of the parasite is a danger to its preservation. The parasite, like the host, has weapons or dodges which aid in self-preservation and these it utilizes, and one dodge is drug resistance. Administration of antibiotics disturbs the ordinary bacterial ecology of the body and disrupts the delicate balance between organisms. The inhabitants of mouth, throat, upper respiratory tract, intestinal canal, vagina and skin that are resistant to one antibiotic may multiply when that antibiotic is used to suppress an infection.[3]

Solution to the Changing Character of Infections

In the light of consideration of infection as a biologic phenomenon should we interfere in the host-parasite relationship? In situations where the association is not inimical to man there is no reason to disturb or change it; however, it is obvious that the ideal host-parasite relationship is not operative for all infections affecting man and rickettsial diseases serve as an example. Use of some wide-spectrum drugs for rickettsial infections or for typhoid fever may cause temporary elimination of the relatively harmless *E. coli* in the gastrointestinal tract and may result in superinfection, a penalty that may have to be paid when such antibiotics are used to overcome infections where the balance is often heavily weighted against man. However, the possibility of superinfection demands careful consideration of antibiotic prophylaxis and treatment.

Chemotherapeutic and antibiotic agents should be used wisely. This can be accomplished, first, by determining the agent causing the infection and secondly, by combating resistance and superinfection. Too often treatment is begun before the organism causing the infection has been isolated from blood, spinal fluid or a lesion. There is an urgency to get the patient under treatment. The following quotation[8] states the problem, "The use of antibiotics has forced the physician to face a series of antinomies encountered in his daily practice. Among these contradictions is the . . . obligation to distinguish between the need for a diagnosis and the imperative duty to apply treatment: *to know* and *to cure,* the cognitive and the operative actions." Having found the causative agent use the antibiotic indicated, which can be done without sensitivity tests except when dealing with an organism the strains of which have been shown to exhibit wide variation in susceptibility to the antibiotics under consideration.

Several means are available to combat resistance and superinfections. New antibiotics may be introduced; fortunately, this has occurred frequently enough since the discovery of sulfonamides so that a choice in prophylaxis or treatment has been available. With ample choice of drugs, resistance is less likely to be a serious hindrance to treatment. A few simple rules for chemotherapy should be observed:

1. Avoid indiscriminate use of antibiotics when of no real value, as exemplified in the following viral infections: the common cold, respiratory infections (of presumed viral origin), primary atypical pneumonia, viral hepatitis, and the common viral infections such as chickenpox, measles, rubella, and mumps. The advantage of using antibiotics in viral infections results from the suppression of secondary invaders, but there are disadvantages. Actually, the use of the drugs favors organism resistance, host sensitization and untoward reactions and the occurrence of intractable

infections such as moniliasis, staphylococcal enteritis, and others.

2. Give the correct dose of the proper antibiotic only as long as necessary attempting to end the infection rapidly.

3. Use combinations of antibiotics and/or sulfonamides only when a single antibiotic will not do.

4. Where long term treatment is necessary, as in tuberculosis, skillful alternation of combinations becomes necessary.

5. Where topical application is as suitable as systemic, use neomycin or bacitracin for skin and conjunctival infections.

6. Use a sulfonamide when indicated. It may be the drug of choice, as in meningococcus infections: it may overcome the shortcomings of antibiotics: or, combined with antibiotics, they may be synergistic in action, result in potentiation, and prevent superinfection.

7. Substitute isolation for prophylaxis to prevent cross-infection in hospitals as the result of contact with healthy carriers among hospital personnel. This can be accomplished by putting patients in cubicles or single rooms, by using aseptic technique and by restricting the number of staff members attending and caring for the patient. This may appear to be a retrograde procedure, for isolation and quarantine procedures have been minimized considerably over the past several decades; yet when one encounters hospital infections, particularly staphylococcal, like those cited by Dowling, Lepper and Jackson [9a,b] and Spink[10] among others, it is necessary to assess critically the situation and determine whether or not isolation might not be a better means of holding in check such cross-infections than the continual prophylactic use of sulfonamides or antibiotics.

Summary

In this paper an attempt has been made to present a number of facets of the problem of changing infections. Many factors are responsible for the changes noted in any given period of time. Change is a common biologic phenomenon. Combating infection, when necessary and under varying circumstances, is not simple. Use of antibiotics results in interference with the host-parasite relationship and may result in desirable and undesirable changes from the standpoint of the host and of the parasite. Undesirable host changes can be minimized by proper use of antimicrobial and chemotherapeutic agents.

Anderson[11] has considered the problem of the changing character of infections from the biologic standpoint and has suggested the proper attitude toward treatment of infections. He aptly states, "The parasites will tend, in time, to find a method of circumventing our form of interference. The newest antibiotics place in our hands the means of making profound changes in the microbiology of man. Let us see that we use them with thoughtfulness."

References

1. Smith, G.: Plague on Us. New York: The Commonwealth Fund, 1941.
2. Garrod, L. P.: The reactions of bacteria to chemotherapeutic agents. Brit. Med. J., 1:205, 1951.
3. Hofer, J. W., and McCaskey, G. M.: Infection occurring during antimicrobial therapy. Arch. Int. Med., 93:44, 1954.
4. Van Beneden, P. J.: Animal Parasites and Messmates, 2nd edition. New York: Appleton, 1876.
5. Vaughan, V. C.: Epidemiology and Public Health. Vol. 1, page 59. St. Louis: C. V. Mosby Co., 1922.
6. Smith, T.: Parasitism and Disease. Princeton: Princeton University Press, 1934.
7. Martí-Ibañez, F.: In quest of a broad spectrum. Some philosophical perspectives of antibiotics. Internat. Rec. Med., 168:105 (March) 1955.
8. Martí-Ibañez, F.: The Philosophical Impact of Antibiotics on Clinical Medicine. Antibiotics Annual (1954-1955). New York: Medical Enclycopedia, Inc., p. 17.

9a. Dowling, H. F., Lepper, M. H., and Jackson, G. G.: Clinical significance of antibiotic-resistant reactions. J.A.M.A., 157:327 (Jan. 2) 1955.

9b. Dowling, H. F., et al: Observations on the epidemiological spread of antibiotic-resistant staphylococci with measurements of the changes in sensitivity to penicillin and aureomycin. Am. J. Pub. Health, 43:860 (July) 1953.

10. Spink, W. W.: Staphylococcal infections and the problem of antibiotic-resistant staphylococci. Arch. Int. Med., 94:167 (Aug.) 1954.
11. Anderson, T.: A review of infectious diseases during the first half of this century. Changing concepts in common fevers. Tr. Med.-Chir. Soc., Edinburgh, pp. 22-32, 1952.

Suggested Reading

Finland, M.: Clinical uses of currently available antibiotics. Brit. Med. J., 2:1115 (Nov. 21) 1953.

Finland, M.: Antibiotic resistant micrococcic infections. Guest Editorial, J.A.M.A.. 158:188 (May 21) 1955.

Congenital Obstruction of the Small Intestine and Colon

B. G. LANNIN, M.D.
N. LOGAN LEVEN, M.D.
LYLE A. TONGEN, M.D.
Saint Paul, Minnesota

CONGENITAL obstruction of the small intestine and colon occurs much more frequently than has been generally realized. Considering atresia alone, the incidence, according to Webb and Wangensteen,[15] in 1931 was about 1 in 20,000 births. However, some twenty years later Evans,[4] after an extensive review of the world's literature, estimated the incidence to be about 1 in 1,500 births, and further calculated that this condition resulted in the death of about 3,000 babies annually in the United States and of more than 50,000 in the rest of the world. Wilson, Nelson, and Harshbarger[18] have estimated that the average operative mortality is about 80 per cent, and therefore believe the number of children that are lost each year in the United States is about 2.200. They further state that this latter figure is approximately the same as the number of deaths (through fifty-five years of age) from appendicitis in the United States in 1949 and also equals the deaths from rheumatic fever in all ages. The significance of the above statement is obvious and emphasizes the need for improvement in the management and mortality of these infants.

There are additional causes of obstruction besides atresia. The others which will be considered in this report are volvulus of the mid-gut with malrotation of the colon, meconium ileus, and one extremely interesting case of congenital intussusception.

Complete Atresia or Incomplete Atresia (Stenosis) of the Small Intestine and Colon

Because of its common etiological origin, this group of cases will be considered together. However, the various locations of the lesions will be found in Table I. The embryological failure of vacuolation and resulting re-establishment of intestinal lumen determines the site and whether the persistent defect will be complete or partial. This theory has been accepted by most authors with the possible exception of Evans.[4]

The most common site in this small series was the duodenum. However, Gross,[7] who undoubtedly has had the largest experience in this country with these infants, observed a slightly higher incidence in the ileum. The jejunum, colon, and multiple areas of involvement are less common.

Clinical findings in these infants are quite typical and have been well described. Vomiting almost invariably occurs within the first day of life, and progressive distention will develop, depending upon the site of the obstructing lesion. With low obstructions, the vomitus will be fecal in odor and tremendous distention may develop.

A flat plate of the abdomen taken within the first day or two is ordinarily sufficient to establish the diagnosis. The differential diagnosis is of somewhat academic importance, as, with the possible exception of meconium ileus, once the diagnosis of obstruction has been made exploration is advisable and the site is relatively unimportant. Farber's[5] test of the meconium may prove to be a useful but not essential aid in determining the completeness of the obstruction. We agree with most authors[3,13] that barium by mouth is not only unnecessary but may be actually harmful because of future difficulties with aspiration, inspissation, and evacuation.

Treatment.—The importance of the preoperative care of these children cannot be overemphasized. The actual operative procedure is only a small but obviously highly important step in the successful management of these infants. Preoperative and postoperative gastric suction, careful and judicious administration of parenteral fluids, transfusions, vitamins and antibiotics are all essential and do not need further emphasis. The improvement in anesthesia in the past few years has undoubtedly aided materially in the reduction of mortality and morbidity in these infants, and we

---

Presented before the Minnesota Academy of Medicine, January 12, 1955.

TABLE I. LOCATION AND DISTRIBUTION OF LESIONS IN SMALL BOWEL AND COLON

Location	No.	Living	Dead
Atresia duodenum	7	5	2
Stenosis duodenum	5	3	2
Atresia jejunum	2	1	1
Absence ileum and cecum	1	0	1
Stenosis colon	1	1	0
Total	16	10(62%)	6

have been extremely fortunate in the past few years of having the services of skilled anesthesiologists.

We customarily employ a long muscle splitting rectus incision and believe that careful but complete evisceration of the intestinal tract is necessary for accurate diagnosis. The technical maneuvers necessary to perform an anastomosis in these infants are well known to members of this audience. Our preference is for a one row, open side-to-side anastomosis, using non-absorbable suture for the duodenal lesions. In the jejunal and lower small bowel obstructions an end-to-end anastomosis is customarily employed. We have also observed that the lower obstruction cases have a longer convalescence and period of adjustment and may exhibit partial chronic distention for many months.

A brief case history of each patient follows:

R. K., white male infant, was born April 29, 1945, with a birth weight of about 7 pounds. This child started vomiting within the first twenty-four hours of life but passed several small meconium stools. On May 2, a small swallow of barium was given by mouth, which showed complete atresia in the first portion of the duodenum. There had been no bile noted in the vomitus, but there was bile in the meconium. On May 3 exploratory laparotomy was carried out, at which time a complete atresia was noted at the junction of the first and second portions of the duodenum. In addition the colon was not completely rotated, and the mesentery was rather loosely attached. A duodenojejunostomy was carried out, and the child made an uneventful convalescence and was dismissed from the hospital on June 8, 1945. The child was last seen on July 18, 1947, at which time a normally functioning anastomosis was observed between the duodenum and small bowel, with normal emptying of the stomach. The child was developing normally in all respects.

L. T., white female infant, was born January 22, 1946, with a birth weight of 6 pounds 4 ounces. This child also showed persistent vomiting of all her feedings within the first forty-eight hours, and x-ray examination was done on January 25, at which time a small amount of barium was given, and revealed complete obstruction of the second portion of the duodenum. The child was explored on the same day, at which time it was noted there was a complete atresia of the duodenum with jejunum being extremely small, with a diameter of about 4 millimeters. A duodenojejunostomy was carried out, following which the child made a very satisfactory recovery and was dismissed from the hospital on February 24, 1946. She was last seen on December 15, 1947, at which time a gastrointestinal x-ray was made which showed an entero-anastomosis in the duodenum which functioned satisfactorily.

J. D. S. was born January 28, 1948, at another hospital. The child was premature and the birth weight was 3 pounds 9 ounces. The child started vomiting within the first few hours, although it was observed that the child had several small meconium stools. The child was carried on intravenous and subcutaneous fluids but failed to gain weight and was transferred to the Children's Hospital on February 3, 1948, at which time the child's weight was 2 pounds 14 ounces. The diagnosis of prematurity and high intestinal obstruction was made, and the child was prepared with transfusions, plasma, and intravenous feedings. On February 4 exploration was carried out, at which time a complete atresia of the first portion of the duodenum was observed. The small bowel was found to contain bile, and a duodenojejunostomy was carried out. The child did fairly satisfactorily for the first three postoperative days, but expired rather suddenly on the fourth postoperative day. Postmortem examination was done, and the essential findings were congenital atresia, complete, of the duodenum, duodenojejunostomy, hemorrhage at the anastomosis, hemoperitoneum, hypertrophy and dilatation of the esophagus, stomach, and duodenum, and prematurity.

J. S., white female infant, was born February 2, 1948, with a birth weight of 6 pounds 4 ounces. This child was born after a normal delivery but shortly after birth, when fed, vomited bile-stained fluid. X-ray examination was done, which showed a huge dilated stomach and duodenum, and a diagnosis of congenital atresia of the duodenum was made. The child was transferred to the Children's Hospital, and on February 6, 1948, exploratory laparotomy was carried out. A complete atresia of the third portion of the duodenum was observed, with bile being aspirated from the stomach. A retrocolic duodenojejunostomy was carried out, following which the child made a satisfactory convalescence and was dismissed from the hospital on March 14, 1948. She was last seen on April 15, 1948, at which time she had had no vomiting and was gaining satisfactorily.

L. G., white female infant, was born September 6, 1949. The child's birth weight was 5 pounds 15 ounces, and it had appeared normal for the first two days of life. However, the child then started to vomit and subsequently several coffee-ground emeses were observed. The child was admitted to the hospital on September 8, 1949. Physical examination revealed a well developed, well nourished, slightly jaundiced newborn female. X-ray examination of the upper gastro-intestinal tract revealed complete obstruction of the duodenum just distal to the duodenal bulb. On September 9 the child was taken to surgery, at which time a complete atresia of the duodenum was noted above the ampulla. The stomach and first portion of the duodenum were found to be markedly distended. An anastomosis was then done between the first portion of the jejunum and the stomach. The child seemed to do fairly well following surgery but expired on the first postoperative day. The essential autopsy findings showed complete atresia of the duodenum, with hypertrophy of the proximal portion, recent anastomosis which was intact, and acute aspiration pneumonia.

L. A., white female infant, was born March 12, 1952. Vomiting which contained bile-stained material was observed in this child within the first forty-eight hours. On March 16, 1952, a flat plate of the abdomen showed the first and second parts of the duodenum and the stomach markedly dilated and filled with gas. A small mixture of lipiodol in mineral oil was injected, which showed a complete stricture at the junction of the second and third parts of the duodenum. Exploration was carried out on March 16, at which time an atresia was noted in the duodenum in the region of the superior mesenteric vessels. A retrocolic duodenojejunostomy was carried out, following which the child made a satisfactory convalescence and was discharged from the hospital in good condition. However, the child was again admitted to the hospital on May 9, 1952, with a history of recurrent vomiting for the past forty-eight hours, and had had no stools in the past twenty-four hours. Flat plate of the abomen was made, which showed many loops of distended small bowel with no evidence of air in the colon. Nasal suction was instituted, and repeat examination on May 10 and May 11 showed no improvement in the degree of distention in the abdomen, and on May 11 the child was re-explored. At this time it was observed that approximately 2 feet of the distal ileum had become adherent and rotated 180 degrees, forming a strangulation obstruction of this portion of the bowel. The strangulated segment was excised, and a one row open anastomosis made in the distal ileum. The child made an uneventful convalescence following this procedure and was dismissed from the hospital on May 18, 1952, weighing 9 pounds 3 ounces. The child was last seen on August 25, 1952, at which time the child was developing satisfactorily, and the parents moved to another city.

J. M., white female infant, was born January 25, 1954, with a birth weight of 4 pounds 8½ ounces. During the first day of life this child developed typical symptoms of upper intestinal obstruction, and a diagnosis of atresia of the duodenum was made. Unfortunately in addition this child exhibited typical findings of mongolism. On January 27 duodenojejunostomy was carried out, following which the child made a good convalescence but was not able to be discharged from the hospital until April 28, 1954, because of an ulceration on the buttocks which developed from an intramuscular injection. At the time of discharge the child weighed 7 pounds 3 ounces and has not been seen since.

Baby D., white male infant, was born February 14, 1949. This child had been born by cesarean section and weighed 6 pounds 8½ ounces at birth, the indication for section being incipient toxemia of pregnancy. Following delivery it was observed the child vomited all feedings and showed progressive abdominal distention. It was admitted to the Children's Hospital on February 17, 1949. Exploratory laparotomy was done on February 17, at which time a stenosis of the first portion of the duodenum was observed. A catheter was inserted into the stomach, but this could not be passed beyond the first portion of the duodenum. In addition there was a loose attachment of the mesentery with malrotation of the colon, the cecum and appendix being in the right upper quadrant. There was a narrow band extending from the cecum across the second portion of the duodenum, which was divided. An anastomosis was made between the third portion of the duodenum and the distal end of the stomach. Postoperatively the child did quite satisfactorily, and the abdomen became flat and meconium stools were passed by rectum. Lipiodol was given by mouth, which showed satisfactory progression through the small intestine, and feedings were started on the third postoperative day. However, on the sixth postoperative day the child suddenly became quite cyanotic, with an episode of extreme respiratory distress, and it was felt that the child had massive pulmonary edema or pneumonia. The child went downhill quite rapidly and expired on February 23, 1949. Postmortem examination showed atresia of the duodenum with a functioning gastroduodenostomy. In addition there was acute pulmonary edema and congestion, congenital malrotation of the colon, congenital hypoplasia of the kidney, and bilateral undescended testes.

T.G., white male infant was born November 20, 1949, birth weight 6 pounds 8 ounces. This child was a well developed, well nourished, white male infant, who began, when he was about sixteen hours old, to have emesis of copious amounts of light green mucous. On the second and third day he was started on skim milk, and he would retain these feedings for two or three hours and then regurgitate in projective fashion. A diagnosis of bowel obstruction was made, and he was taken to surgery, where a congenital stenosis of the second portion of the duodenum was observed. There was in addition, a malrotation and failure of fixation of the mesentery of the small intestine with a volvulus of the entire small bowel. This was replaced and a duodenojejunostomy performed. The initial postoperative course was quite satisfactory, and the child was gradually started on feedings which were increased. By the fourteenth postoperative day it was noted that the infant had become slightly jaundiced but was having stools. However, a few days later he vomited and had only two stools, and the following morning it was observed that the abdomen had become markedly distended with board-like rigidity, and the child had coffee-ground emesis. He was again taken to surgery on December 19, at which time a volvulus of the entire small bowel had again occurred, and it was unfortunately observed that the entire small bowel was gangrenous. The entire area was resected and an anastomosis made between the jejunum, about 10 centimeters below the previous anastomosis, to the terminal ileum about 6 centimeters above the cecum. Postoperatively the child did surprisingly well initially but gradually lost weight, with multiple frequent stools, and all attempts to support the child gradually failed, and he expired on February 1, 1950, at the sixty-ninth hospital day. Postmortem examination showed the entire length of functioning small bowel to be about 9 to 11 centimeters. There was in addition duodenal atresia, functioning side-to-side duodenojejunostomy, functioning end-to-end jejuno-ileostomy, hypostatic pneumonia, bilateral pleural effusion, and obstructive jaundice.

L. F., white female infant, was born October 17, 1950, with a birth weight of 6 pounds. This child did fairly well for the first few days of life but then began to have recurrent vomiting and inability to retain the feedings and showed weight loss. The child was admitted to the hospital on October 28, 1950, when she was eleven days of age, and x-ray examination revealed a high-grade obstruction of the third portion of the duodenum. The child was prepared with parenteral fluids for a few days, and on November 3, 1950, exploration was carried out, at which time a congenital stenosis of the third portion of the duodenum was observed. A duodenojejunostomy was performed, following which the child made a fairly satisfactory convalescence and was dismissed from the hospital on December 19, 1950, in a satisfactory condition.

S. S., white female infant, was born following an uneventful pregnancy on December 1, 1953. This child in the first few days developed symptoms of upper intestinal obstruction with vomiting and repeated regurgitation. The diagnosis of congenital stenosis of the duodenum was made, and exploration was carried out on December 6. At this time a stenosis of the second portion of the duodenum was observed, and a duodenojejunostomy was performed. This child made a very satisfactory convalescence and was dismissed from the hospital on the ninth postoperative day and has since been followed by her local physician.

M. W., white female infant, was born October 7, 1950. This child had typical findings of atresia of the esophagus without a tracheo-esophageal fistula. X-ray examination revealed no gas in the abdomen, and a catheter could not be passed through the esophagus. On October 10 exploratory laparotomy was done, at which time it was observed that the upper portion of the esophagus was exceedingly short, and anastomosis in a primary fashion would be impossible. For that reason a gastrostomy was performed, following which the child did fairly satisfactorily. On October 18 cervical esophagostomy was performed, and the child again did fairly well until it was observed that considerable difficulty was being encountered through the gastrostomy feedings, and a lipiodol study revealed high-grade obstruction in the duodenum. Exploration was again done on October 25, at which time a stenosis of the third portion of the duodenum was observed, and a gastro-enterostomy was performed. Following this the child made a satisfactory convalescence. The child continued to do well and has since had a reconstruction of the esophagus done by a retrosternal jejunal loop, the first stage of which was done on June 25, 1952, with subsequent reimplantation of the lower portion of the jejunum on the stomach on November 26, 1952. This child was last seen on June 4, 1954, in excellent condition, eating normally and developing as a normal four-year-old child.

J. R., white male infant, was born January 5, 1947, with a birth weight of 6 pounds 4 ounces. This child very soon developed signs of intestinal obstruction and became markedly distended. X-ray examination revealed typical findings of intestinal obstruction and exploration was carried out on January 9, 1947. At the time of exploration an area of atresia was observed in the jejunum, which was about 2 inches in length. An entero-anastomosis was made about the area of atresia, but the child continued to have considerable difficulty in the convalescent period with recurrent obstruction. On the fifth day postoperatively complete wound separation was observed, and the child was again taken to the operating room on January 14, 1947. At this time the previous anastomosis was inspected, and it did not appear to be functioning, so the area of atresia was completely excised, the two ends of the jejunum inverted, and a side-to-side jejunojejunostomy carried out. Following this the child made a slow convalescence and was dismissed from the hospital on February 21, 1947. The child was seen several times following this and continued to have bouts of chronic small bowel obstruction, and on many occasions visible peristalsis could be observed through the thin abdominal wall. The child was then transferred to the University Hospital, and in June, 1948, exploration was again done and an extensive enterolysis was carried out, and the blind end of the side-to-side anastomosis was resected. Following this the child improved, and a telephone call to the patient's mother on October 1, 1954, was made, at which time she stated that the child was entirely normal and was going to school and getting on with no further difficulty.

G. S., white female infant, was born April 24, 1953. This child was one month premature and at birth weighed 3 pounds 6 ounces. On the first day it was observed that the child regurgitated the feedings, along with much greenish stained mucus. X-ray examination of the abdomen was made, which showed multiple large loops of dilated bowel, and in addition a perforation in the colon was observed on lipiodol enema. On April 27 exploration was carried out, at which time multiple areas of atresia were observed in the ileum, and an anastomosis was made between the mid-jejunum and cecum. In addition, a longitudinal tear in the rectum was sutured, which had undoubtedly been caused by previous instrumentation. The patient tolerated the surgery fairly well but did not ever completely recover and expired twenty hours postoperatively. The essential findings at autopsy were prematurity, multiple atresias of the ileum, bilateral atelectasis, recent jejunocecostomy, hypertrophy and dilatation of the jejunum.

S. R., white male infant, was born March 15, 1952. This child's mother was a diabetic but carried the child to delivery without difficulty and the birth weight was 6 pounds 5 ounces. The child was first fed on the second day, at which time he immediately regurgitated all his feeding, following which the abdomen became distended. The abdominal distention increased, and the child was taken to surgery, at which time the jejunum was found to be greatly dilated and ended in a blind pouch. There was no intervening bowel between that point and the ascending colon, and no cecum was present. The length of the jejunum was measured to be 29 centimeters. The colon was about the size of a lead pencil but appeared to be normal. An end-to-end anastomosis was made between the colon and the blind end of the small bowel, and the postoperative status appeared to be fairly satisfactory. The child was treated with continuous nasal suction, and he had several stools. However, he subsequently developed fecal emesis, and repeated x-ray examination showed no evidence of gas progressing through the colon. The distention was recurrent, but finally obstruction was apparently again complete, and on April 28, reoperation was carried out, at which time the anastomosis was found to be patent but was somewhat kinked and not functioning. The bowel was aspirated and a rectal tube was inserted from below through the anastomosis. On the second postoperative day the child developed signs of severe cardiorespiratory collapse, and he expired on April 30, 1952, on the forty-seventh day. Postmortem examination revealed congenital absence of the ileum and cecum, jejunocolostomy with partial atresia, and atelectasis of the lungs.

S. O., white female infant, was born January 4, 1945, admitted to the Chrildren's Hospital March 1, 1945. The presenting complaint was vomiting and distention, present since birth. X-rays showed enormous megacolon with narrowing and stricture of the rectum and sigmoid. On March 6, 1945, a cecostomy was performed. However, the bowel content was packed so solid that adequate decompression could not be carried out at the time of operation. The cecostomy was subsequently opened, and after some time the bowel content was evacuated. Because this fecal fistula did not entirely divert the bowel content, a left inguinal colostomy was performed on March 30, 1945. The patient was in critical condition for several months, requiring parenteral fluids most of the time. Subsequently numerous dilatations of the stenotic cecostomy were carried out. On November 23, 1948, a right colectomy by means of obstructive resection was performed, together with closure of an ileocolic fistula that apparently had developed following the first operation. The patient's general condition improved, but there seemed to be some chronic small bowel obstruction. The double-barreled ileostomy-colostomy was closed by resection and end-to-end anastomosis February 28, 1949. Because of dysfunction of the bowel due to atony of the ileum and distention of the colon, a resection of a segment of diluted ileum and colon was carried out April 10, 1950. On October 12, 1950, the left sigmoid colostomy was closed. This patient got along fairly well but had bouts of bowel obstruction intermittently. On February 11, 1952, a left colectomy was carried out, together with resection of a segment of terminal ileum. The ileum was then anastomosed to the sigmoid colon. The patient did fairly well but again became intermittently obstructed. On October 13, 1952, the remaining portion of the sigmoid was resected, together with some more of the terminal ileum. At this time a closure of a large defect in the mesentery at the site of former anastomosis was closed. And end-to-end anastomosis was performed between the ileum and the rectum. Since that time the patient has gotten along well and has had no further trouble with obstruction.

Results.—The survival rate in this small series of cases was 62 per cent. This compares favorably with other reported series[2,6,7,12,14] but still leaves room for improvement. Because of the association of other anomalies and prematurity, a substantial mortality will probably always exist. The unfortunate significant occurrence of mongolism in the cases of duodenal atresia has been mentioned by Gross[7] and one of our survivors unhappily substantiates this observation. The causes of death in this series will be noted in the case histories. It is hoped that with earlier diagnosis, improved anesthesia, and more diligent pre- and postoperative care, an increase in survival rate will occur.

Volvulus of Small Intestine and Malrotation of Colon

In these conditions also the embryological origin has been well established and to Ladd[9,10] must go a great deal of credit for his contributions in diagnosis, surgical management, and improvements in mortality rates for this developmental arrest. The majority of these cases occur within the first few days of life and may be indistinguishable clinically from the preceding group of cases of atresia.

The differential diagnosis is again of academic interest only, as surgical exploration is nearly always indicated in the early case. However, there is also a more chronic recurrent type of symptom-complex which may occur in the older age group and, as will be noted in the case histories, one of our patients was a ten-year-old boy.

In the infants a flat plate of the abdomen is again all that is usually necessary to establish the diagnosis of obstruction. In the older group with recurrent attacks, a barium enema may demonstrate the malrotation of the colon, and barium by mouth will show the evidences of duodenal obstruction.

The treatment of these conditions has been well established and we have nothing to add. Again, complete evisceration of the intestinal tract is essential to making an accurate diagnosis and carrying out adequate therapy. The importance of careful preoperative and postoperative management again cannot be overemphasized.

D. G., white male infant, was born November 3, 1948, following a normal delivery, with a birth weight of 6 pounds 14 ounces. The day following birth it was observed that the abdomen was markedly distended and that during the first twenty-four hours the child had had only one small mucoid stool. Examination revealed the abdomen to be markedly distended with gas and no palpable masses could be felt. The impression was intestinal obstruction of a congenital origin, and on November 4, about forty-eight hours after birth, exploratory laparotomy was carried out. A loop of small intestine was found to be distended and gangrenous as a result of a volvulus, and this loop, together with the cecum and a portion of the ascending colon, were resected and an end-to-end anastomosis carried out between the small bowel and the colon. The postoperative course was satisfactory initially, although the child experienced episodes of recurrent distention. However, barium given by mouth and also by barium enema showed the anastomosis to be functioning satisfactorily. The child, however, soon contracted an infectious diarrhea, from which he never recovered in spite of all attempts at supportive therapy, and the child eventually expired on the ninety-seventh hospital day. The postmortem findings showed the length of the bowel from the pylorus to the anastomosis to be 22 inches and from the anastomosis to the anus 18 inches. The additional findings were atelectasis of the lungs, patient ductus arteriosus, peritoneal adhesions.

T. S., white male infant, was born February 13, 1949, birth weight 5 pounds 14 ounces. This child was born at another hospital but apparently shortly after birth the infant started to vomit bile-stained contents, and at about the age of two weeks an exploratory laparotomy was done. At this operation, according to the mother, there was found "an ulcer opening into the belly with milk escaping into the abdomen." No pyloric tumor was found. Since the operation the child had occasional chocolate colored emesis and stool streaked with fresh and old blood. For two weeks prior to admission the child had some signs of obstruction, and on the day of admission had vomited all of his feedings and had been having bloody emesis and stools. Examination revealed a twelve and one-half-week-old white infant, who was quite malnourished, wasted, and chronically ill in appearance. X-ray examination of the gastrointestinal tract was done by means of lipiodol injected in the stomach, and partial obstruction of the second portion of the duodenum was observed, which was thought possibly due to stricture or congenital bands. In addition there was a nonrotation of the colon, which was located in the left upper abdomen. The child was placed on continuous gastric suction and hydrated parenterally for several days. On May 18, 1949, exploration was carried out, at which time numerous adhesions were found in the region of the old incision and liver. The duodenum was found to be constricted by a peritoneal band, which was divided, extending from the malrotated colon across to the right posterior lateral wall of the abdomen. No other evidence of pathology was observed, and the abdomen was closed. Postoperatively the infant's condition remained fairly satisfactory and the abdomen was flat, although he continued to have occasional loose, black stools. On May 31, about two weeks postoperatively, this child suddenly began to gasp fitfully and expired quite suddenly. Postmortem examination revealed a large peptic ulcer of the esophagus with ulcerating esophagitis, postoperative intestinal adhesions, and inanition.

J. W., white male infant, was born March 16, 1950, with birth weight 7 pounds 12½ ounces. Shortly after birth it was observed that the child's abdomen was distended and generally edematous, and the child was spitting up meconium. He was transferred to the Childrens Hospital, at which time generalized edema was noted, and the abdomen was distended and rigid. A surgeon was called in consultation, who explored the baby, and apparently at the time of surgery the child's condition was quite unsatisfactory. The abdomen contained much bloody fluid, and the bowel appeared grayish in color. A drain was inserted, and the abdomen was closed. Following this, however, the child continued to respond quite satisfactorily, although the distention and rigidity remained. X-ray examination was made on March 21, 1950, with lipiodol injected into the stomach, at which time upper small bowel obstruction was observed. After repeated transfusions and intravenous fluids, exploration was again done on March 21, 1950. The old incision was opened and universal adhesions of the bowel to the abdominal wall was found. A necrotic segment of small bowel was observed, with a volvulus noted with a 360 degree twist at the base. An enterolysis of the entire small bowel was carried out and an end-to-end anastomosis made in the jejunum, with an interrupted single layer suture. Microscopic section of the removed specimen showed it to be ulcerating gangrenous bowel. Postoperatively the child's convalescence was gratifyingly smooth, and on March 26 x-rays showed no evidence of bowel obstruction. The child was dismissed from the hospital on April 26, 1950, weighing 6 pounds 4½ ounces. He was last seen on October 22, 1951, with a slight discharge from the umbilicus, which was cauterized, but in other respects the child was normal and developing satisfactorily.

N. T., white female infant, was born November 15, 1950, with a birth weight of 4 pounds 15 ounces. This child showed symptoms of intestinal obstruction with vomiting and distention shortly after birth, and was admitted to the Childrens Hospital on November 18. After preoperative preparation on November 19, exploratory laparotomy was carried out, at which time a 360 degree rotation of the entire small bowel was found about the superior mesenteric vessels. This was corrected without difficulty, and no strangulation was present. A catheter was inserted through a gastrotomy opening in the anterior wall of the stomach and could be passed well into the duodenum and proximal jejunum without difficulty. The child made an uneventful convalescence following this procedure and was dismissed from the hospital on December 3, 1950, entirely asymptomatic.

R. G., white boy, was ten years old when he was first seen August 12, 1948, giving a history of recurrent abdominal pain with vomiting since early childhood. These bouts were recurrent in nature and ordinarily would be relieved by vomiting. X-ray examination was done, which showed malrotation of the colon and upper intestinal obstruction. On August 24, 1948, exploration was carried out, at which time it was observed there was a malrotation of the colon and small bowel, with the cecum lying in the left upper quadrant. The stomach and first portion of the duodenum were enormously dilated, and there were many adhesions which ran anteriorly across the duodenal surface. The adhesions were divided, but there appeared in addition to be marked obstruction of the duodenum by the superior mesenteric artery, and for that reason a duodenojejunostomy was done about the obstruction at the superior mesenteric vessels. The child made a very satisfactory convalescence and was dismissed from the hospital on September 9, 1948. He was last seen September 13, 1948, at which time he was completely recovered and had had no further attacks of obstruction.

Results.—Again the survival rate in these few cases was 60 per cent. As will be noted in the case history, one of our failures seemed to be an early technical success but eventually succumbed to an uncontrollable infectious diarrhea. However, another of our cases is most gratifying, as at the initial operative procedure the prognosis appeared hopeless and nothing definite was done. A secondary exploration carried out a few days later, at which time a rather extensive resection was done, resulted in complete recovery and demonstrates that even the most desperate cases can occasionally be salvaged. It is again hoped that with early diagnosis and skillful surgical management an improved survival rate can be accomplished.

Meconium Ileus

This condition has proved to be one of the most difficult obstructive mechanisms to deal with and is still followed by a formidable mortality. This is not surprising in view of the multiple areas of pathologic involvement which make up the entire picture. Many cases which may survive the obstructive phase initially will eventually succumb to the disease because of the pancreatic and pulmonary pathology.

The differential diagnosis here is of considerable importance, as an occasional case may be salvaged by medical measures. Palpation of the firm abdominal masses and x-ray evidence of areas of calcification and granular-appearing intestinal loops will suggest the proper diagnosis in the majority of cases.

A wide variety of surgical procedures have been attempted and none of them have been uniformly successful. Both of our cases were treated by ileotomy and irrigation and expression of the obstructive meconium. There was one survival.

We have had no experience with the Mickulicz exteriorization procedure recommended by Gross[7] but may employ it in the future.

It would seem that improvement in medical and dietary management as well as better surgical techniques will be necessary for a reduction in the mortality of this discouraging condition.

J. M., white male infant, was born July 15, 1948, with a birth weight of 6 pounds 10 ounces. Shortly after birth it was observed that the child's abdomen became increasingly distended with persistent bile-stained vomitus. X-ray examination showed a high-grade small bowel obstruction, which was unimproved after twelve hours' gastric suction. The child was transferred to the Childrens Hospital, where a diagnosis of bowel obstruction on the basis of meconium ileus or possible volvulus was made. On July 17 exploration was carried out, at which time solid meconium was observed to be blocking the small bowel from the first portion of the jejunum to the ileocecal valve. An attempt was made to decompress the bowel by insertion of a needle, which was unsatisfactory, following which a number 14 catheter was inserted, and it was again impossible to aspirate any of the tenaceous meconium. A transverse incision was made in the terminal ileum, following which a large quantity of saline was injected and the small bowel was milked free of the meconium as completely as possible. The defect in the ileum was then closed with interrupted silk and the abdomen closed. The child made a satisfactory convalescence following this procedure and was dismissed from the hospital in satisfactory condition. The boy was last seen on April 23, 1951, at which time he looked in a very satisfactory condition and had had no respiratory infections.

M. L., white male infant, was born May 17, 1949. This child was born following a normal delivery, but since birth the abdomen had been observed to become progressively distended with no bowel movements. There was a family history of a four-year-old sibling with congenital pancreatic fibrosis. Physical examination revealed a one-day-old white male infant with a markedly distended abdomen. A lipiodol enema was given, which filled the entire colon, and it was observed that the terminal ileum contained fairly large masses of rather foamy appearing material which suggested a meconium ileus. The child was placed on gastric suction without improvement, and on May 20 exploratory laparotomy was carried out. The terminal ileum was packed solidly with hard inspissated meconium, and a small transverse incision was made, following which a large amount of meconium could be evacuated. About 30 cc. of pancreatic extract were injected into the terminal ileum before the enterotomy opening was closed. Postoperatively the child did fairly well for the first few days and the suction was discontinued on the third postoperative day. The child began to have firm stools about ten days postoperatively, although he occasionally regurgitated his feedings. On the fifteenth postoperative day the child was observed to have a rather profuse diarrhea and became quite dehydrated. The abdomen again became distended and the child expired quite suddenly on June 5, 1949. Postmortem examination revealed fibrocystic disease of the pancreas, pulmonary congestion with bronchopneumonia, and chronic low-grade peritonitis.

Congenital Intussusception

This case[11] is included because after a preliminary survey of the literature it would appear to be exceedingly uncommon. In Gross's[7] series of 702 cases, the youngest patient was three days of age. Clubbe[1], reporting on 270 cases, states his youngest patient was three months old. Perrin and Lindsay[13] in their monograph based on 400 cases, state their youngest patient was one day old. Hogg and Donovan[8] report on 123 cases and state that one patient was less than one month of age.

Because of its apparent rarity the following case is reported:

D. D., white male child, born on March 1, 1943, with a birth weight of 6 pounds 4 ounces. Examination at the time of delivery showed a tear in the right scrotum with a large scrotal hernia on the left. The penis could not be seen because of the edema of the prepuce and scrotum. The child was taken to surgery about twelve hours after delivery. At the time of operation it was observed that the right scrotum had a long laceration about 4 inches in extent, which communicated with an opening in the hernial sac from which bile-stained fluid escaped. The prepuce was retracted, a catheter was inserted into the bladder, and a few cubic centimeters of clear urine was obtained. The hernia was repaired by ligation of the sac, and a similar incision was then made on the left side and a large hernial sac was opened there, and again some meconium-flecked fluid was obtained from the general peritoneal cavity. The hernial sac was ligated and both wounds closed with interrupted silk.

A low left rectus incision was then made, and on opening the abdomen a considerable amount of bile-stained fluid and meconium was present. A search was made for the perforation in the bowel, and this was found where an intussusception had occurred in utero and apparently was several weeks in duration. A segment of intussuscepted bowel could not be reduced, and about 1½ inches of intussuscepted bowel, which appeared to be mummified, was resected. It was determined then that the bowel at the point of intussusception had been lacerated nearly across the entire lumen and allowed the escape of the bile and intestinal contents to distend the abdomen and thus push out the hernial sacs, which had then become ruptured during delivery. An end-to-end anastomosis was carried out. Four grams of sulfanilamide powder were left about the anastomosis and closure was carried out with interrupted catgut. The following day, March 2, because of marked edema of the prepuce, a dorsal slit was carried out and a soft number 8 catheter passed into the bladder. Postoperatively intermittent gastric aspirations were carried out and some old bloody clots were observed to be passed on about the sixth day, but this subsequently stopped. Feedings were started on the ninth postoperative day, and the baby was discharged from the hospital on April 9, 1943, on the thirty-ninth hospital day, with a weight of 6 pounds 11¾ ounces. The child was last seen on December 23, 1947, at which time the abdomen was excellent and both testes were in the scrotum. The child was otherwise normal.

TABLE II. SUMMARY OF ALL PATIENTS

Location	No.	Living	Dead
Atresia duodenum	7	5	2
Stenosis duodenum	5	3	2
Atresia jejunum	2	1	1
Absence ileum and cecum	1	0	1
Stenosis colon	1	1	0
Volvulus of small bowel and malrotation of colon	5	3	2
Meconium ileus	2	1	1
Congenital intussusception	1	1	0
Total	24	15(62%)	9

Summary and Conclusions

1. Atresia and other obstructions of the intestine occur more commonly than is generally realized.

2. Early diagnosis and improvements in preoperative and postoperative care and in anesthesia have improved the survival rate considerably.

3. Although a significant percentage of these children will always be lost because of associated incompatible anomalies, a far greater number can be salvaged and be restored to lead entirely normal lives.

(Continued on Page 664)

Industrial Deafness

Every Physician's Problem

KINSEY M. SIMONTON, M.D.
Rochester, Minnesota

ESTIMATES suggest that 80 per cent of practicing physicians do some degree of industrial medicine. It is safe to assume that the remaining 20 per cent occasionally are asked for an opinion concerning loss of hearing. The above estimates justify the title of this presentation.

Loss of hearing resulting from exposure to loud sounds is not uncommon. All workers exposed to high levels of noise for a period of years lose some hearing. The loss is insidious in onset. The initial loss of hearing occurs for high-frequency sounds that are not present in the conversational voice; thus, the loss is well developed before it is recognized by the patient. The first sign of hearing loss of this type usually is poor understanding for conversation, especially in a background of noise from other voices or when the speaker is at some distance from the listener. Initial recognition often occurs in the home, where radio or television interferes with understanding of conversation. When this complaint is presented and the history indicates exposure to loud noises, a diagnosis of deafness resulting from acoustic trauma must be considered.

Industrial deafness is not a new subject. Fosbroke[1] mentioned blacksmith's deafness in 1831, referring to "modern and older writers on the subject." For many years, loss of hearing was accepted by workers as the inevitable accompaniment of employment in noisy industry. With increased application of power in industry, greater numbers of workers are exposed to noise of potentially damaging intensity. Concurrent with increase in exposure to noise has been a change in philosophy that tends to hold the employer responsible for injurious consequences of employment. Loss of hearing caused by noise falls into this class and has become compensable under the workmen's compensation laws of several states.

The pressure of increasing numbers of claims for compensation has been the instigation of a number of studies of the effect of noise on hearing. The most comprehensive study is being directed by the Subcommittee on Noise in Industry of the Committee on Conservation of Hearing of the American Academy of Ophthalmology and Otolaryngology. This study has the active cooperation of labor and management, as well as financial support of the insurance industry. The studies in progress include long-term observation of workers exposed to various degrees of noise; when completed, they should add significantly to knowledge of the subject.

TABLE I. ENERGY VALUE OF THE DECIBEL

Decibels	Energy units
0*	1
30	1,000
60	1,000,000
90	1,000,000,000
120	1,000,000,000,000

*Accepted value for 0 decibel=0.0002 dyne per square centimeter.

Nature of Sound

Sound is a form of energy propagated as a wave motion through various media. Air is the only medium pertinent to the problem in question. Noise has been defined as unwanted sound. Sound has three dimensions, namely intensity, frequency and duration.

The intensity of sound can be measured and is expressed as pressure exerted on a given area of surface. The unit of sound energy is the decibel, which is a logarithm to the base 10 representing the energy content of the sound. Thus, if 0 decibel represents 1 unit of energy, 10 decibels represent 10 units, 60 decibels represent 1,000,000 units and 120 decibels represent 1,000,000,000,000

Read at the meeting of the Minnesota State Medical Association, Rochester, Minnesota, May 21 to 23, 1956.

From the Section of Otolaryngology and Rhinology, Mayo Clinic and Mayo Foundation, Rochester, Minnesota.

The Mayo Foundation, Rochester, Minnesota, is a part of the Graduate School of the University of Minnesota.

units of sound energy (see Table I). We may marvel that an organ capable of stimulation by 1 unit of energy is capable of withstanding a trillion times that force. Some industrial noises may reach peaks as high as 150 decibels.

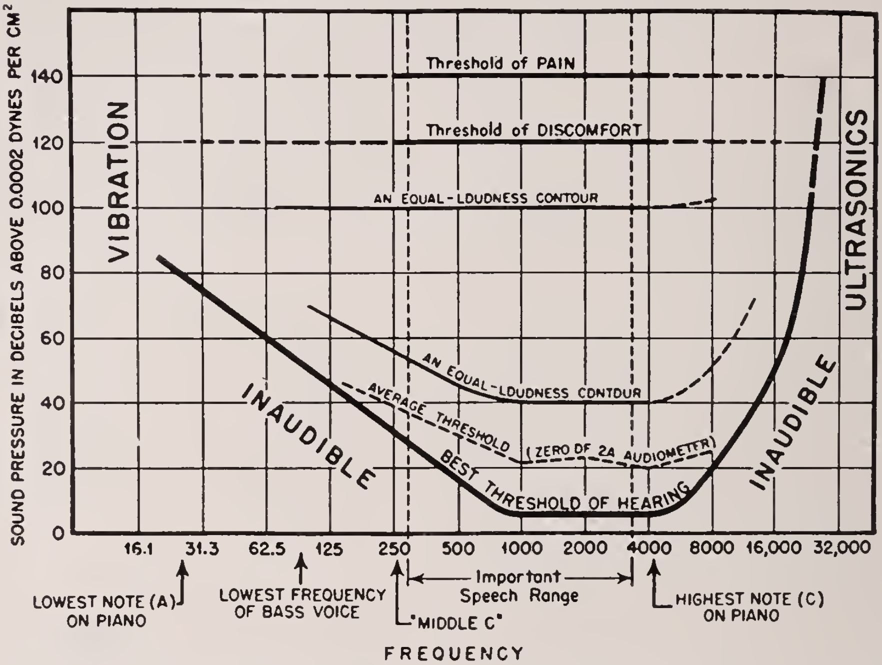


Fig. 1. Sensitivity range of human ear. (Reproduced with the kind permission of the publisher from Glorig, Aram and Wheeler, D. E.[2])

The frequency of a sound refers to the number of vibrations occurring in a unit of time and is commonly expressed as cycles per second. Frequency determines pitch. Doubling the frequency of a tone raises the pitch by one octave. The frequency of "middle C" on the piano is 256 cycles per second. Sounds made up of a single frequency or harmonious frequencies are called "tones." Sounds comprising mixed or unharmonious frequencies are called "noise."

Intensity and frequency are both important to the problem of loss of hearing. The human ear is most sensitive to the frequencies represented in the conversational voice. It follows that the ear is damaged most easily by noises made up of these frequencies.

The energy required to stimulate the ear is much greater for high and low frequencies than it is for the middle frequencies (Fig. 1). This has led to the adoption of two sets of values for the decibel. The physicist has set the value of 0 decibel at 0.0002 dyne per square centimeter. This value is used for measurement of levels of noise in industry. The physiologist accepts the value of 0 decibel as the average threshold of hearing by a group of young adults who have no known defect of hearing. This is the scale used on the audiometer. In this scale, the energy value of 0 decibel differs for each frequency but approximates the physicist's value for the middle range of frequencies.

Measurement of Noise

The measurement of noise is the function of the acoustic engineer. Using calibrated equipment, he can determine the over-all intensity of noise and the intensities present at various frequencies (Fig. 2). Three types of equipment are required. A noise-level meter is used to measure sounds of reasonably constant intensity, and an oscilloscope is used to measure impact-type noises of short intensity. The frequency analyzer can be used in conjunction with either instrument.[2]

Effects of Noise on Man

Kryter[3] reviewed the literature on the effects of noise on man. Working in noise apparently has no effect on the ability to concentrate or on the output of work. However, auditory communication is hampered to a pronounced degree, which varies with the ratio of loudness between noise and signal. The human larynx lacks the power to be heard over noises of extreme loudness.

Experience shows that prolonged exposure to loud noise will damage hearing. How much noise and how long an exposure can be tolerated remain undecided. Individual susceptibility to acoustic trauma varies greatly and as yet there is no valid predictive test to determine which individual ears are "tender." Prolonged exposure to noise having an intensity of 90 to 100 decibels will damage some highly sensitive ears; 100 to 120 decibels will damage most ears and intensities of more than 120 decibels will damage all ears.[4]

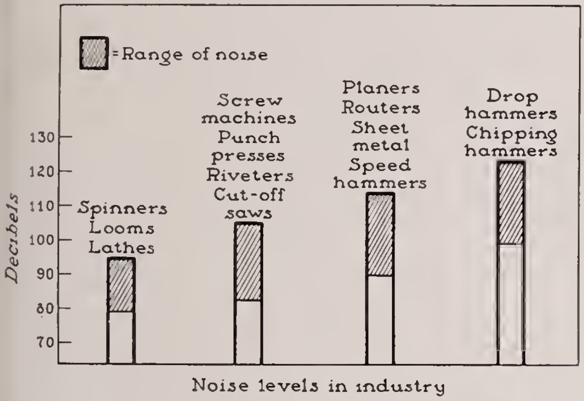


Fig. 2. Levels of noise in various industrial processes. (Reproduced with the kind permission of the publisher from pamphlet issued by the American Academy of Ophthalmology and Otolaryngology.[6])

Loss of Hearing from Noise

Loss of hearing that results from exposure to loud noise is of the perceptive type. The loss is primarily for high tones, and bone-conduction thresholds parallel air-conduction thresholds. Audiometric evidence, in the form of a dip at 4,000 cycles per second, precedes awareness of the loss (Fig. 3). The deficit in hearing is progressive with continued exposure to loud noise but is most rapid at the inception of exposure. Two types are recognized. Reversible loss, called "auditory fatigue" or "temporary threshold shift," is most prominent in the early stages of exposure to noise. It is accompanied by a sense of fullness in the head and by tinnitus. Many normal persons experience this after exposure to loud noise, such as shooting. The symptoms usually subside within twenty-four hours. Permanent loss of hearing develops more gradually.

Observations on animals which have been exposed to intense noises reveal degenerative changes in the cochlea. Microscopic studies indicate a correlation between demonstrated loss of hearing and cochlear lesions.[5]

Perceptive deafness results from many causes, all of which must be considered in making the diagnosis of acoustic-trauma deafness. Presbycusis, the loss of hearing due to age, closely parallels industrial deafness. The history often renders it possible to recognize the etiologic factors in deafness caused by injury, sickness, drugs or toxins. Recognition of acoustic trauma is important from the standpoint of prevention of further loss and because of the factor of compensation.

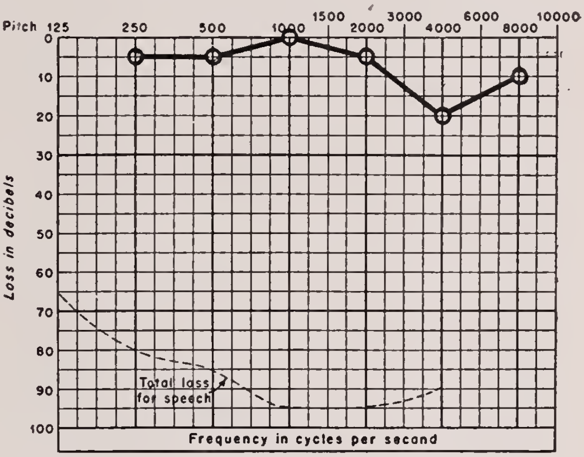


Fig. 3. Audiogram characteristic of early acoustic trauma.

Loss of hearing that affects the high tones usually is not recognized until it reaches the frequency range of the conversational voice. Impairment of threshold at 2,000 cycles per second causes decrease in ability to recognize consonants. Thus, the patient is able to hear the voice in conversation but finds difficulty in understanding. Comprehension is greatly depressed in the presence of noise of any sort and by weakening the signal from any cause, such as distance. Hearing is extremely poor for whispers.

Prevention of Deafness

Deafness in general is not preventable. Deafness caused by exposure to noise is preventable to a large degree. Elimination of deafness as an industrial hazard is possible, just as silicosis has been eliminated as an industrial disease. Prevention of industrial deafness requires a threefold program of tests for hearing, engineering and protection of the ear.[6]

The testing program includes pre-employment tests for every new employe. Repeat tests should be done after thirty to forty-five days of exposure to noise. At this point, workers who show significant change in threshold should be transferred to a less noisy environment. Regular recheck is advised every six to twelve months thereafter. Repeat tests always should be done at least twenty-four hours after the last exposure to noise. The test recommended is the pure-tone air-conduction audiogram, including frequencies at octave and half-octave intervals from 250 to 8,000 cycles per second. Repeatability of tests depends on standardization of technique. The level of noise in the testing room should not exceed 50 decibels. The room should be in a quiet location away from roadways, steam pipes and heavily travelled corridors. Acoustic insulation usually is required to achieve the desired levels of sound. The audiometrist should follow a standard technique for establishing the threshold of hearing, and the audiometer should be calibrated at frequent intervals.

Engineering methods include isolation of noisy zones, absorption of sound and prevention of noise at its source by design of the machines involved.

Protection of the ear is accomplished by means of earplugs, ear muffs or helmets. Earplugs are most acceptable to the workers but still are not popular. Protective devices interfere with hearing in quiet but many actually improve hearing in loud noise by reducing the distortion that occurs when extremely loud sounds are impressed on the ear.

Compensation

Deafness caused by noise in industry is recognized presently in many states as a compensable disability. Formulas for evaluating loss of hearing in terms of percentage disability as a basis for compensation have been adopted in several states. The problem of compensation for loss of hearing is only now arising in Minnesota; this delay perhaps reflects the small number of workers employed in noisy industries in the state. Increase in noisy operations, as in the developing taconite industry, suggests that this problem will grow in Minnesota.

Minnesota at present has no specific law covering compensation for loss of hearing caused by noise. Cases arising on this basis probably will be considered under the section of the compensation laws dealing with occupational disease.

The Committee on Conservation of Hearing of the Minnesota State Medical Association has submitted recommendations for evaluation of loss of hearing to the Industrial Commission of Minnesota. The aim of the Committee is to aid in establishing a uniform and equitable formula for settlement of such claims, based on the best available scientific and medical information.

Physician's Role in Hearing-Conservation Programs and Compensation

The industrial physician, with the consultation of an otologist, should be the director of programs for the conservation of hearing in industry. It should be his duty to organize and supervise the program of tests for hearing and to assure himself of the qualifications and training of the audiometrist. He should, with the advice of the otologist, establish requirements for employment. The advice of the otologist should be sought in the placement of persons who do not meet established requirements. Workers who show changes in hearing on follow-up tests should be referred to the otologist for evaluation and advice.[7]

Evaluation of the hearing of candidates for compensation should be the responsibility of an otologist experienced in problems of hearing. The otologist should report the degree and type of loss of hearing and estimate the effect of employment in its causation. In this role, he should act as an impartial expert. The determination of compensation is not a medical function and should be entirely the responsibility of the Industrial Commission.

References

1. Fosbroke, John: Practical observations on the pathology and treatment of deafness. Lancet, 1: 645-648 (Feb. 12) 1831.
2. Glorig, Aram, and Wheeler, D. E.: An introduction to the industrial noise problem. Illinois M. J., 107:10-16 (Jan.) 1955.
3. Kryter, K. D.: The Effects of Noise on Man. (Monograph.) J. Speech & Hearing Disorders. Suppl. 1, pp. 1-95, Sept., 1950.
4. American Academy of Ophthalmology and Otolaryngology, Subcommittee on Noise in Industry of the Committee on Conservation of Hearing: Guide for Physicians Concerned With Hearing Conservation in Industrial Noise. [Pamphlet. Privately printed.]
5. Rüedi, L.: Different types and degrees of acoustic trauma by experimental exposure of the human and animal ear to pure tones and noise. Ann. Otol., Rhin. & Laryng., 63:702-725 (Sept.) 1954.
6. American Academy of Ophthalmology and Otolaryngology, Subcommittee on Noise in Industry of the Committee on Conservation of Hearing: A Guide for Conservation of Hearing in Industry. [Pamphlet. Privately printed.]
7. Fox, M. S.: The otologist's role in the industrial hearing conservation program. Laryngoscope, 64: 79-88 (Feb.) 1954.

A Clinical Method of Assessing Drug Therapy in Parkinsonism

With Special Reference to Psychologic Factors

SIDNEY K. SHAPIRO, M.D.
Minneapolis, Minnesota

PREVIOUS reports of methods of assessing therapeutic effect of new drugs in Parkinsonism have failed to consider adequately the psychotherapeutic effect of the change in medication. Some have maintained that there is a direct relationship between the enthusiasm of the doctor and the therapeutic effect of the new medication. Others have raised the objection that the improvement of the patient following a change in medication is due to the psychic uplift which the patient derives from such a change, and not due to any pharmacologic action of the drug itself. In devising the present method for assessing new drugs, the above factors were taken into consideration and an effort made to minimize their importance. In addition to the clinical method for assessment of drug therapy which was evolved, interesting observations were made as to the emotional factors encountered in assessing new drugs in Parkinsonism.

Clinical Study

Phenergan,® Diparcol® and a placebo were used in this study. Diparcol, a synthetic compound (diethylamino, 2,ethyl-N, dibenzo-parathiazine hydrochloride) available in 62.5 mg. enteric coated tablets, produces parasympatholytic effects, and early reports[1-3] indicated it might be of use in the treatment of Parkinsonism. Phenergan (diethyl-amino-2-methyl-l-ethyl)-N-dibenzoparathiazine) belongs to the group of anthistamines and was provided in 25 mg. tablets for this study. The enthusiastic report of Budnitz[4] on the use of antihistamines in the treatment of Parkinsonism provided the rationale for the assessment of this drug.

Phenergan, Diparcol and a placebo were delivered to the dispensary without ever having been seen by the examiner, so that he would not be familiar with the physical characteristics of these compounds. The dispensary assigned the the following numbers to each of the compounds: 2000-I, 2000-II, 2000-III. The key to the identity of the drugs was held only by the dispensary, and not until this study was completed and the results tabulated was their composition revealed to the examiner. Throughout the course of this study, the patients were seen exclusively by the author and thus psychic factors contingent upon change of the patient-doctor relationship were kept constant for the whole group.

The patients were studied for a six-month period. It was felt that the initial psychic effect of a change in medication would be dissipated over this period of time. The patients were urged to continue with their new medication in spite of ill effects or in spite of any deterioration in their condition. Only when the patient refused to continue or his clinical condition made a change mandatory was other medication substituted. Six patients received one or more of the compounds, two patients receiving all three.

No effort was made to select the patients for this study and thirty consecutive patients attending the Parkinsonism clinic were studied. To the first ten 2000-I, to the second ten 2000-II, and to the last ten 2000-III, was administered. Previous medication was stopped and the new medication substituted. The patient's condition was assessed both objectively and subjectively at frequent intervals during the study. It was thus possible to compare the early responses of the patient to the medication to the response at the termination of that medication. The objective

---

From the Division of Neurology, University of Minnesota Medical School, Minneapolis, Minnesota.

criteria by which the patients were judged for evaluation of drug therapy are as follows:

1. Time taken to dress.
2. Ability to comb hair.
3. Ability to wash.
4. Ability to shave.
5. Ability to clean teeth.
6. Ability to get in and out of a chair.
7. Distance the patient is able to walk.
8. Ability to write.
9. Time taken for an average meal.
10. Ability to hold and read newspaper.
11. Other evidence of improvement.

They concerned functional activities of the patient, primarily daily self-care and ambulation, and a significant improvement in one or more of these activities was recorded as a good result. The subjective response of the patient was correlated with his objective performance and did not constitute the basis for assessment of the efficacy of the drug.

Results

Since two patients failed to return to the clinic, the remaining twenty-eight constitute the basis for this report. Eleven patients received 2000-I, thirteen patients received 2000-II, and thirteen patients received 2000-III, later identified as Phenergan, placebo and Diparcol respectively.

In all the patients receiving 2000-I (Phenergan), the results were very poor. Their symptoms became so severe that only two were able to complete the six-month trial. Three of the patients complained of mild transient nausea, dryness of the mouth and dizziness. Similarly the condition of the patients receiving 2000-II (placebo) deteriorated and only two patients were able to complete the six months of treatment. Transient dizziness was mentioned by two of the patients receiving 2000-II (placebo).

However, in the group of patients receiving 2000-III (Diparcol) two patients (Cases 17 and 23) achieved results superior to those obtained from all previous medications. In the remainder of the patients in this group, the results of 2000-III (Diparcol) administration were poor. The high incidence of toxic symptoms was responsible for the large number of poor results. In two patients the toxic symptoms, consisting of nausea, vomiting, hyperthermia and leukopenia, necessitated immediate discontinuance of the drug. In six additional patients nausea, vomiting and dizziness were encountered. One of these patients complained of tenesmus.

Of particular interest was the comparison in the group receiving the placebo (2000-II) between the initial and final assessments. Any improvement in the clinical condition of the patients in this group must of necessity be due to psychic factors. In three (Cases 8, 27, 9) of the thirteen patients in this group the initial assessment at the end of thirty, forty-two and sixty days respectively, revealed a favorable response. However, by the end of 110, 56, and 120 days respectively the results had become poor.

In twenty-two of the twenty-eight patients there was a direct correlation between the objective clinical response of the patient, as measured by the criteria outlined above, and the subjective response of these patients to their change in medication. In the remaining six patients there was a marked discrepancy between the patient's favorable subjective response and the objective clinical picture.

Case 1, while receiving 2000-I (Phenergan), and Case 22, while receiving 2000-I (Phenergan) and 2000-II (placebo), reported definite subjective improvement while their objective clinical picture remained unchanged. In Case 2 on 2000-I, in Cases 10 and 27 on 2000-II, and in Case 28 on 2000-III (Diparcol), there was a definite deterioration in the patient's condition while they continued to state that they felt improvement.

Comment

To our knowledge, this is the first study on drug therapy in Parkinsonism in which the objectivity of the examiner was insured by the fact he did not know which of the patients were receiving placebos and which were receiving the active drugs. The fact that three of the patients receiving placebos achieved a good therapeutic effect for a period of one to four months stresses the importance of allowing a sufficient period of time to elapse before a report on a new drug is made. We feel that six months constitutes a minimum period and that preferably a year should elapse. The danger of relying solely on the subjective statement of the patient as to the efficacy of his medication is pointed out by the fact that in six of the patients their clinical condition failed to show improvement or actually deteriorated, while subjectively they reported a good result.

(Continued on Page 674)

Now Available

7 Years Sickness Benefits

(HOUSE CONFINEMENT NOT REQUIRED)

Lifetime Accident Benefits

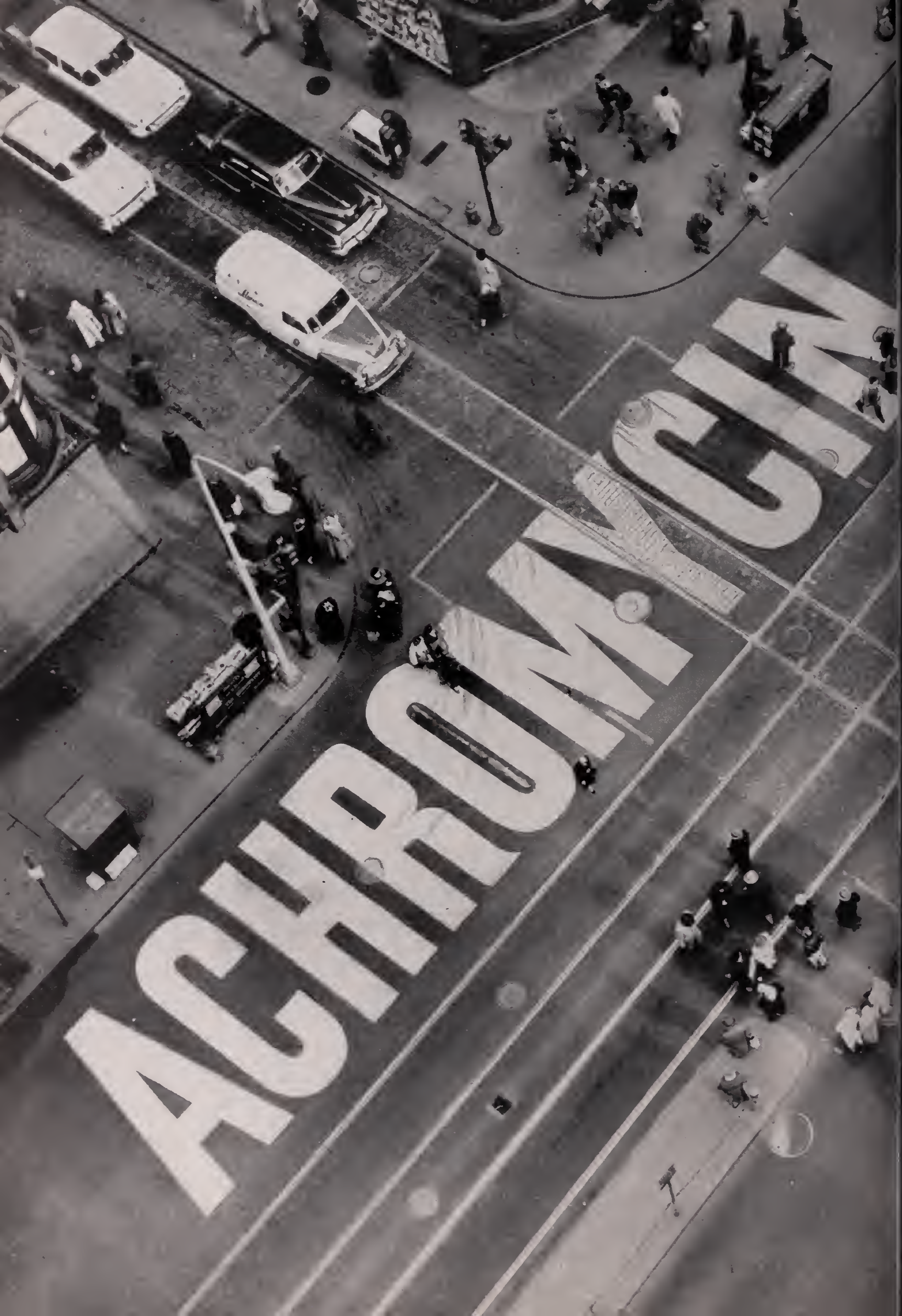
This extension of benefits is now available to you as a member of the Minnesota State Medical Association. Since December, *1947*, the inception date of our plan for members of your Association, the Caswell-Ross Agency has attempted at all times to secure for you the finest coverage in the accident and sickness field. This long term coverage makes this plan one of the best available today. Why not write or call us about it now?

CASWELL-ROSS AGENCY

1177 N. W. Bank Building
Minneapolis 2, Minnesota
Minneapolis—FE 2-2585
St. Paul—MI. 5-7004

Administrators of Professional Disability Plans

Minnesota State Bar Association
Minnesota State Dental Association
Minnesota Society of C. P. A.
Minnesota State Pharmaceutical Assn.
Minnesota Auto Dealers Association
Minnesota Federation of Eng. Societies
Minnesota State Veterinary Medical Soc.
Hennepin County Medical Society
Hennepin County Bar Association
11th Judicial Bar Association
Minneapolis Association of Life Underwriters
Minnesota State Life Underwriters Assn., Inc.
Ramsey County Medical Society
Ramsey County Bar Association
St. Paul District Dental Soc.
Minneapolis District Dental Soc.
St. Cloud Dental and Stearns County Medical Society
Duluth District Dental Society
East Central Medical Society
St. Louis County Medical Society
West Central Dist. Dental Society
Northwest Proprietors Association
St. Paul Life Underwriters, Inc.


ACHROMYCIN

ACHROMYCIN*

Tetracycline *Lederle*

for prophylaxis and treatment of

obstetric infections

Posner and his colleagues[1] have reported on the use of tetracycline (ACHROMYCIN) in 96 cases of obstetric complications, including unsterile delivery, premature rupture of the membranes, endometritis, parametritis, and other conditions. They conclude that this antibiotic is ideally suited for these uses.

Other investigators have shown ACHROMYCIN to be equally useful in surgery and gynecology and virtually every other field of medicine. This outstanding antibiotic is effective against a wide variety of infections. It diffuses and penetrates rapidly to provide prompt control of infection. Side effects, if any, are negligible.

Every gram of ACHROMYCIN is made in Lederle's own laboratories and offered *only* under the Lederle label—your assurance of quality. It is available in a *complete* line of dosage forms, including

ACHROMYCIN SF

ACHROMYCIN with STRESS FORMULA VITAMINS. Attacks the infection, bolsters the patient's natural defenses, thereby speeds recovery. Especially useful in severe or prolonged illness. Stress formula as suggested by the National Research Council.

SF Capsules, 250 mg.
SF Oral Suspension, 125 mg. per teaspoonful (5 cc.)

For more rapid and complete absorption. Offered only by Lederle!

dry-filled sealed capsules

---

[1] Posner, A. C., *et al.;* Further Observations on the Use of Tetracycline Hydrochloride in Prophylaxis and Treatment of Obstetric Infections, *Antibiotics Annual* 1954-55, pp. 594-598.

Lederle

LEDERLE LABORATORIES DIVISION
AMERICAN CYANAMID COMPANY
PEARL RIVER, NEW YORK

*REG. U.S. PAT. OFF.

PHOTO DATA: SPEED GRAPHIC CAMERA,
F.16, 1/50 SEC., ROYAL PAN FILM

In this and future issues of your Journal . . .

. . . The Year Book Publishers will bring you announcements and news of its current and future publications.

For 56 years The Year Book Publishers has been bringing the medical profession the best in medical books. Through the 13 Annual Year Books on medicine, surgery, and the specialties, *plus* more than 100 manuals, monographs, handbooks, and texts, the interests of virtually every major field of practice are served. Two of our latest volumes are described below, both available for 10 days' inspection on approval. A complete catalog and descriptive literature of any individual title will be gladly sent on request. Our service facilities are always at your disposal; please call on them fully.

William B. Kiesewetter's
Pre and Postoperative Care in the Pediatric Surgical Patient

Just Ready—Recognizing that the pediatric surgical patient is not simply a little adult but one requiring specialized consideration and care, this new manual is devoted to the specific steps and procedures in management developed to highest efficiency in one of the country's oldest children's hospitals. Concentrating on the more common surgical disorders and problems, it has been pointed particularly at those for whom pediatric surgery is the occasional problem. It is not a large book, but its utility is wide indeed. All who treat children will want it. *By 16 Authorities.* Edited by William B. Kiesewetter, M.D., Associate Professor of Surgery, School of Medicine, University of Pittsburgh; Surgeon-in-Chief, Children's Hospital of Pittsburgh. 360 pages; with 49 illustrations. Approx. $7.50

Robert P. McCombs' Internal Medicine
A Physiologic and Clinical Approach to Disease

Published in Sept. — A physiologic and clinical approach to disease; a "short" practice of medicine written in the modern vein which already has become one of the medical best sellers of the year. Compact, concise, moderately priced, thoroughly utilitarian, complete and modern in all aspects. Dr. McCombs follows the modern trend toward replacement of empirical therapeutics with methods seeking restoration of normal function through application of sound physiologic principles. Specific diagnostic and therapeutic measures are fully, but always concisely detailed, including laboratory tests.

By Robert P. McCombs, M.D., Professor of Graduate Medicine, Tufts University School of Medicine. 659 pages; illustrated. $10.00

Watch for the next "Year Book" Notice in the November Issue

Year Book PUBLISHERS

5-10-6

The Year Book Publishers, Inc.
200 East Illinois Street, Chicago 11, Illinois
Please send for 10 days' examination.

☐ Kiesewetter's Pre and Postoperative Care, Approx. $7.50

☐ McCombs' Internal Medicine, $10.00

☐ Current Catalog, no charge

Name__________ Street__________

City__________ Zone_____ State__________

Cardiac Arrest

GILBERT S. CAMPBELL, M.D.
Minneapolis, Minnesota

CARDIAC arrest may occur at any time during the anesthetic and operative procedure. Although cardiac arrest is more prone to occur in certain types of operative procedures, nevertheless the danger of cardiac standstill is omnipresent and both the surgeon and the anesthesiologist must be keenly aware of this danger.

The first recorded anesthetic death occurred in Newcastle-upon-Thyne on January 28, 1848, and a recording of the inquest appeared a short time thereafter (Fatal Application of Chloroform, 1848).[1] The patient was a fifteen-year-old girl who was subjected to chloroform while undergoing removal of the nail from the great toe of the right foot because of onychia. Death occurred three minutes after the first inhalation of chloroform, and when the case came to trial the jury's verdict was "we are unanimously of the opinion that the deceased, Hannah Greener, died from congestion of the lungs, from the effects of chloroform, and that no blame can be attached to Mr. Meggison, surgeon, or to his assistant, Mr. Lloyd."

Within two weeks after the recording of this death the comments of Simpson (who had introduced chloroform clinically two months earlier) appeared in the same journal.[2] Simpson wrote "The unfortunate patient certainly died when under the influence of chloroform, not however, as I believe from its effects, but from the effects of the means used to revive her . . . the girl died, then, as I conceive . . . choked or asphyxiated by the very means intended to give her life." (Meggison had dashed water in the patient's face and had given her some brandy, a little of which she swallowed with difficulty).

A single unsuccessful attempt to resuscitate a young woman who collapsed under chloroform was reported by Steiner in 1871,[3] and the method used was "electropunctur" of the heart.

The second recorded attempt to resuscitate a human heart by direct cardiac massage appeared in 1898 (Tuffier and Hallion.)[4] The patient was a twenty-four-year-old man who exhibited cardiac arrest five days after the drainage of an appendiceal abscess. By means of direct intrathoracic massage the heart action and respiratory movements returned for a few minutes but then ceased. The autopsy examination revealed a large pulmonary embolus.

In 1902 Starling and Lane[5] reported the first complete recovery following cardiac arrest. The patient was a sixty-five-year-old man, under ether anesthesia, who had a laparotomy for adhesions about the colon. The subdiaphragmatic route of cardiac massage was utilized and after a "squeeze or two . . . felt it re-start beating." Artificial respiration was continued for twelve minutes when natural respiration recommenced.

Keen[6] reviewed the literature on cardiac massage up to the year 1904 and among the twenty-seven cases of cardiac massage which he reported was one of his own cases and a case of Igelsrud. Doctor Kristian Igelsrud of Norway had not reported his case previously, although it was the first successful cardiac resuscitation (1901). Igelsrud's patient was a forty-three-year-old woman who had an abdominal hysterectomy performed under chloroform anesthesia. Direct cardiac massage (intrathoracically through an opened pericardium) was instituted within four to five minutes after the heart arrested. The patient made a good recovery and was discharged from the hospital after five weeks.

A very good review of the literature on cardiac resuscitation appeared in 1949;[7] and in 1953 Stephenson, Reid and Hinton[8] reported a collection of 1,200 cases of cardiac arrest.

Precipitating Factors in Cardiac Arrest

The following conditions increase the likelihood of cardiac standstill or ventricular fibrillation: hypoventilation with resultant hypercapnia and possibly hypoxia, metabolic acidosis, reflex stimulation under light anesthesia, underlying cardiopulmonary disease, overdosage and multiplicity of anesthetic agents, displacement and torsion of the heart, sudden drop in blood pressure, and rapid

---

From the Department of Surgery, University of Minnesota Medical School, Minneapolis, Minnesota.

changes in blood pH. It is unusual for any one of these precipitating factors to be the sole cause of cardiac arrest, for predisposing conditions are frequently coexistent, complementary and cumulative.

Hypoventilation with air will result in a fall in alveolar and arterial oxygen tensions and a rise in alveolar and arterial carbon dioxide tension. However, hypoventilation with 100 per cent oxygen rarely leads to hypoxemia, but instead leads to carbon dioxide retention. Hypoxemia is usually grossly detectable, as the patient's blood becomes darker in color, but gross evidence of hypercapnia without coexistent hypoxia is lacking. Furthermore, since surgical patients are usually ventilated with gas mixtures containing a high concentration of oxygen, hypo-ventilation leads to hypercapnia without an associated hypoxia. Hypoxia without hypercapnia can be produced only by adequate alveolar ventilation with a low oxygen gas mixture, and clinically this is rarely seen. Finally, it would appear that hypercapnia with or without hypoxia is the usual ventilatory problem in patients undergoing operative procedures. Experimental evidence indicates that hypercapnia or asphyxia augment the cardioinhibitory effects of vagal stimulation, whereas hypoxia per se does not.[9]

Metabolic acidosis tends to potentiate the responses to vagal stimulation and diminish the responses to sympathicomimetic agents.[10,11]

Because vagal stimulation is inadvertently produced at the time of endotracheal intubation or extubation, when the patient is somewhat light and reflexes are less depressed, the occasional cardiac arrests encountered at such times are probably more than coincidental. In fact, Shumacker and Hampton[10] reported five deaths in patients with cardiac disease simultaneously with aspiration through or removal of an endotrachael tube. Mismanagement of anesthetic agents can lead to cardiac arrest; for a good anesthesiologist is a toxicologist with an interest in and a knowledge of cardiorespiratory physiology.

Displacement and torsion of the heart may result in impaired venous filling, impaired coronary flow, et cetera; and a sudden drop in blood pressure provokes a fall in myocardial perfusion. Rapid and major changes in blood pH may occur during surgical procedures as Stead et al[13] and Miller et al[14] have demonstrated.

In general, a rapid change towards an acid blood pH may produce bradycardia and possibly cardiac standstill, whereas a rapid change towards a hyperalkaline blood pH may result in tachycardia, ventricular extrasystoles and ventricular fibrillation.

Diagnosis and Treatment

Frequently the anesthesiologist diagnoses cardiac arrest and reports that he is unable to obtain a pulse or blood pressure. The surgeon should immediately confirm this by palpating an artery in the operative area, or if the chest is open the surgeon should inspect and/or palpate the heart directly.

The successful treatment of cardiac arrest is dependent upon the immediate artificial ventilation of the lungs with oxygen and immediate artificial circulation by manual compression of the ventricles.

No time should be wasted with prolonged auscultation over the chest, with observation of the electrocardiogram, with retinoscopy or with intracardiac drugs. An incision should be made below the left nipple (fourth or fifth interspace) from the sternal border to the mid-axillary line. If no bleeding occurs, the diagnosis of cardiac arrest is confirmed. Since irreversible brain damage occurs in humans after three to four minutes of absent cerebral perfusion, there is no time for procrastination, vacillation or consultation. The chances for successful cardiac resuscitation rapidly diminish as seconds pass. Immediate therapy by relatively unskilled personnel may prove life-saving, whereas a delay of much longer than three to four minutes denies the patient full recovery despite any mortal efforts.

Ventilation of the lungs is most effective through an endotracheal tube, although a tight fitting mask or even mouth-to-mouth breathing has been successful. There is no danger from hyperventilation in a patient with cardiac arrest, whereas, hypo-ventilation perpetuates acidosis and arrest. Consequently, hyperventilation of the patient is probably an important factor in the recovery rate of these patients.

Cardiac massage, or more accurately, artificial circulation by manual compression of the ventricles is most effectively carried out through a thoracic incision. The ventricles should be compressed forty to eighty times per minute, depending upon the adequacy of diastolic filling of the ventricles. If the patient is placed in a moderate

Trendelenburg position, venous filling of the heart is aided. At this juncture the patient will usually have a blood pressure of 50 to 90 mm. of mercury. Once effective ventilation and massage are started, the emergency is over. Ventricular standstill must be differentiated from ventricular fibrillation, since the successful treatment of fibrillation requires electrical shock.

Epinephrine is the drug of choice in cardiac standstill and the dose required is variable. It is better to give multiple small doses (.5 to 1 cc. of a 1:1000 solution) rather than a single large dose, since the latter may convert standstill into fibrillation. If the heart seems refractory to epinephrine, molar sodium lactate solution (20 to 40 cc.) should be injected into the heart. Sodium lactate or sodium bicarbonate will tend to correct the acidosis, and under conditions of acidosis the heart is less responsive to epinephrine.[15] If large volumes of citrated blood have been given prior to the onset of cardiac arrest, intracardiac 10 per cent calcium chloride may prove helpful in restoring myocardial tone. The ideal treatment in ventricular fibrillation obtains a well-oxygenated, well-perfused myocardium with good muscular tone prior to attempting electrical defibrillation. This requires adequate ventilation, effective manual compression of the ventricles and at times intracardiac epinephrine, molar sodium lactate and calcium chloride. Wiggers[16] has demonstrated very clearly the ease with which ventricular fibrillation can be corrected with electrical shock if the myocardium is well oxygenated and has good muscular tone.

Electrical shock is applied to the ventricles with two broad contact insulated electrodes—one electrode on the posterior ventricular surface and one electrode on the anterior ventricular surface. The pericardium should be opened prior to attempts at electrical defibrillation in order to localize the effectiveness of the electrical shock. If the heart does not become defibrillated after the application of one to three shocks (110-250 volts for 0.1-0.3 seconds), the procedure should be temporarily abandoned and vigorous massage should be reinstituted for 1.5 to two minutes, until the myocardium becomes pink once again. A dilated, cyanotic heart is unlikely to be defibrillated and prolonged attempts with electrical shock will result only in burning the myocardium.

Once the heart resumes an effective beat following massage and/or defibrillation, the wound area can be prepared and sterile instruments should be obtained for wound closure. The pericardium should be loosely approximated, for a pericardial closure of this type will prevent displacement of the heart into the pleural cavity and still permit egress of pericardial fluid. The left pleural space should be drained with a large catheter and one million units of penicillin should be instilled into the pleural cavity. Oxygen should be administered via a nasal catheter postoperatively, and meticulous efforts must be made to keep the tracheobronchial tree free of obstructing secretions.

A selected case history is presented illustrating, particularly, an instance in which successful ventricular defibrillation with return of effective cardiac rhythmicity was not accomplished until the underlying cardiac valve defect for which the operation was performed, had been corrected.

Case Summary

Mrs. A. L. T. (U.H. #889145), a forty-five-year-old housewife, was admitted to the University Hospitals with a thirty-year history of rheumatic heart disease with severe mitral stenosis. She had marked dyspnea even on slight exertion and had experienced three major embolizations (cerebral, femoral and splenic) in the three years prior to this admission. The patient had a typical grade IV mitral stenosis murmur, electrocardiographic evidence of right ventricle strain and auricular fibrillation, and roentgenographic examination showed cardiomegaly, left atrial enlargement and prominent pulmonary vascular markings. The patient was brought to the operating room for mitral valvotomy on October 28, 1955. Induction of anesthesia was satisfactory, but as the endotracheal tube was inserted the patient suffered cardiac arrest. An immediate bloodless thoracotomy incision was made through the left fifth interspace anteriorly. The pericardium was opened and the heart was in standstill. After massage and intracradiac epinephrine, ventricular fibrillation appeared. The anesthesiologist ventilated the patient with 100 per cent oxygen and the ventricles were compressed manually at a rate of sixty to seventy per minute. Electrical defibrillation of the heart was accomplished but the cardiac rhythm and tone appeared sluggish. Intracardiac molar sodium lactate was given with only a slight if any beneficial effect. Consequently, the patient was rotated to a left anterolateral position and a mitral valvotomy was done in an expeditious fashion. The mitral valve was very stenotic and would admit only the tip of the index finger. The anterior and posterior commissures split rather easily, but during the intracardiac manipulations the heart again developed ventricular fibrillation. The finger was removed from the heart and the purse string around the base of the left auricular appendage was ligated. Electrical defibrillation was successful once more, and subsequently the cardiac rhythm and tone appeared to be good. The chest wound was closed after the insertion of two chest catheters and the instillation of one million units of penicillin into the left pleural cavity.

The patient developed an infarction of the right lower lung lobe six days postoperatively, but this regressed with anticoagulant and antibiotic therapy. She developed some confusion and disorientation two weeks postoperatively. A serum sodium determination at that time was found to be 126 milliequivalents per liter. The mental confusion disappeared when the hyponatremia was corrected and the patient was discharged from the hospital on November 19, 1955.

Summary

A brief review has been made of early reports of clinical cases with cardiac arrest. The various known precipitating factors in cardiac arrest have been emphasized—i.e. hypoventilation with resultant hypercapnia and possibly hypoxia, metabolic acidosis, reflex stimulation under light anesthesia, underlying cardiopulmonary disease, overdosage and multiplicity of anesthetic agents, displacement and torsion of the heart, sudden drop in blood pressure, and rapid changes in blood pH.

The diagnosis and treatment of this condition has been outlined, and a brief case summary has been presented.

References

1. Fatal Application of Chloroform. Lancet, 1:161-162, 1848.
2. Simpson, J. Y.: Lancet, 1:175-176, 1848.
3. Steiner, F.: Arch. klin. Chir., 12:741-790, 1871.
4. Tuffier, T., and Hallion, L.: Bull. et mém. Soc. nat. chir., 24:937-939, 1898.
5. Starling, E. A., and Lane, W. A.: Lancet, 2:1397, 1902.
6. Keen, W. W.: Therap. Gaz., 28:217-230, 1904.
7. Wiggin, S. C.; Saunders, P.; and Small, G. A.: New England J. Med., 241:370-378, 413-420, 1949.
8. Stephenson, H. E., Jr.; Reid, L. C.; and Hinton, W. J.: Ann. Surg., 137:731-744, 1953.
9. Campbell, G. S.: Abstracts of XVIII International Physiological Congress, Copenhagen, 1950, pp. 142-143.
10. Campbell, G. S.: Surgery, 38:615-634, 1955.
11. Burget, G. E., and Visscher, M. B.: Am. J. Physiol., 81:113-123, 1927.
12. Shumacker, H. B., and Hampton, L. J.: J. Thoracic Surg., 21:48-56, 1951.
13. Stead, W. W.; Martin, F. E.; and Jensen, N. K.: J. Thoracic Surg., 25:435-447, 1953.
14. Miller, F. A.; Hemingway, A.; Brown, E. B., Jr.; Nier, A. O.; Knight, R. T.; and Varco, R. L.: Proc. Surg. Forum, Clin. Congress Am. Coll. Surgeons. Philadelphia: W. B. Saunders Company, 1951, pp. 602-610.
15. Andrus, E. C.: J. Physiol., 59:361-372, 1924.
16. Wiggers, C. J.: Am. J. Physiol., 116:161-162, 1936.

CONGENITAL OBSTRUCTION OF THE SMALL INTESTINE AND BOWEL

(Continued from Page 654)

References

1. Clubbe, C. P. B.: The Diagnosis and Treatment of Intussusception. Oxford University Press, 1921.
2. Donovan, E. J.: Congenital atresia of the duodenum in the newborn. Ann. Surg., 103:455, 1936.
3. Duckett, J. W.: Intestinal obstruction in the newborn. Ann. Surg., 116:321, 1942.
4. Evans, C. H.: Atresias of the gastrointestinal tract. Internat. Abstr. Surg., 92:1, 1951.
5. Farber, S.: Congenital atresia of the alimentary tract: diagnosis by microscopic examination of meconium. J.A.M.A., 100:1753, 1933.
6. Glover, D. M., and Barry, F. M.: Intestinal obstruction in the newborn. Ann. Surg., 130:480, 1949.
7. Gross, R. E.: The Surgery of Infancy and Childhood. W. B. Saunders Co., 1953.
8. Hogg, B. M., and Donovan, E. J.: Acute intussusception in infants and children. Ann. Surg., 124:262, 1946.
9. Ladd, W. E.: Congenital obstruction of the small intestine. J.A.M.A., 101:1453, 1933.
10. Ladd, W. E.: Surgical diseases of the alimentary tract in infants. New England J. Med., 215:705, 1936.
11. Leven, N. L.: Congenital intussusception. To be published.
12. Miller, E. M.: Bowel obstruction in the newborn. Ann. Surg., 110:587, 1939.
13. Perrin, W. S., and Lindsay, E. C.: Intussusception: A monograph based on four hundred cases. Brit. J. Surg., 9:46, 1921.
14. Potts, W. J.: Congenital atresia of intestine and colon. Surg. Gynec. & Obst., 85:14, 1947.
15. Webb, C. H., and Wangensteen, O. H.: Congenital intestinal atresia. Am. J. Dis. Children, 41:262, 1931.
16. Wilson, B. J.; Nelson, A.; Harshbarger, M.: Congenital tresia of the colon. Surg., Gynec. & Obst., 99:34, 1954.

Recent Advances in the Field of Homologous Transplants

RICHARD H. EGDAHL, M.D.
Minneapolis, Minnesota

THE past few years have been witness to several striking medical advances. Intracardiac surgery, for example, is now performed at many medical centers. As an expression of advancement in another important area it now appears that one of the most baffling medical problems is near to solution: the mechanism(s) involved in the rejection of homografted tissue. Little imagination is required for one to visualize the potential therapeutic possibilities of successful homografting. Chronic nephritis, endocrine deficiencies, and safer management for extensive burns are but a few of the many afflictions which might immediately benefit. Technically, almost any organ or tissue, except perhaps the brain, can be transplanted. Liver, heart, kidney and lung have already been relocated with short term survivals in the laboratory.

However, successful clinical homografting is not possible with our present knowledge. Although there are occasional reports of homograft survival, almost all such cases involve identical twins.[1] Cases of successful homografting between unrelated individuals are medical curiosities.[2,3] Fetal parathyroid tissue has been homotransplanted with some success, but results are not uniform and failures are common. In the following discussion a clear distinction must be maintained between autograft and homograft. With autografts, tissues from an individual grafted back onto the same individual uniformly survive permanently and function normally if proper attention is given to technical details. Homografts, however, are foreign to the host and elicit a rejection pattern which is now the subject of intense study in many medical centers.

Homografts fall into two categories, and the difference between each is important. Homostatic grafts serve merely as scaffoldings for the ingrowth of host tissues, but do not function or survive permanently. This type of homograft has found clinical use as a blood vessel or bone prosthesis. Homovital grafts, on the other hand, survive and function in the new host (skin, thyroid, adrenal cortex, et cetera). The rest of this discussion is concerned with the latter type of transplant and the scientific attempts to prolong their survival periods.

It is currently accepted that homotransplant rejection is based on immunologic mechanisms. Very recently, convincing evidence has been offered that there is formation of specific antihomograft antibodies by the host.[4] This adds the final link in the chain of evidence that the host reacts to homografts and foreign proteins or other antigens in a similar fashion. It is probable, however, that both cellular and ordinary antibodies are involved in homotransplant immunity. Medawar[5] has shown that a second skin graft from the same donor to the same recipient will be destroyed at a greatly accelerated rate compared to the first graft between the animals. This "second-set" phenomenon gives a firm foundation to the immunologic theory of homograft rejection. It has been repeatedly confirmed for various organs and tissues in several species of animals.[6,7] Lymphatic absorption of graft antigen appears to be necessary for anti-skin homograft antibody formation.[8] This is shown by the failure of skin grafts in the brain and anterior chamber of the eye (both areas thought to be lacking in lymphatics) to evoke homograft immunity. It has been shown, however, that a homografted kidney completely encased in a plastic bag except for vascular connections, is destroyed at the usual rate.[9] This demonstrated that lymphatic antigen absorption is not necessary for the usual rejection pattern in this organ transplant system.

Although the finer points of these phenomena are not as yet clarified, there are several recent important pieces of research which have a very direct bearing on the problem. Perhaps the most exciting is the discovery of the general principle that exposure of animal fetuses, either *in utero* or in the immediate newborn period, to proteins or

---

From the Department of Surgery, University of Minnesota Medical School, Minneapolis, Minnesota.

Supported by USPHS Grant RG-4332.

living cells from another unrelated animal will immunologically alter the injected animal—presumably for life. The mature fetuses will be unable to form antibodies against the injected material. They will, therefore, accept homografts from the donor animal. This has been demonstrated with skin homografts in both mice and rats.[10,11] Tumors which normally fail to grow in certain strains of mice will grow and kill the animal if tumor cells are injected into fetal or newborn mice of the resistant strains.[12,13,14] Although much basic work remains to be done, there is a fascinating possible clinical application of the principle of "active acquired tolerance," as it is called. If white blood cells or other tissue cells from several adults were injected into human newborns, it is probable that the injected baby in adulthood would accept, permanently, homografts from the donors of the cells. If attempts at homografting in humans in this manner are successful, a large percentage of our future population could be "immunized" at birth and tissue donors would be available at all times during their lives.

Other possibilities are being investigated. It has been found that patients with "agammaglobulinemia"[15], a disease in which there is an absense of gamma globulin in the blood and no humoral antibody formation, will accept homografts permanently. The complete nature of the immunologic defect in agammaglobulinemia is as yet undefined, but studies on the condition will undoubtedly yield much important data. Clinical efforts to produce agammaglobulinemia in an effort to achieve homograft survival must await these clarifying data. Attempts at "desensitization" or "immunoparalysis" have been successful in some animal experiments, with permanent survival of homografts in those animals pre-treated with donor cell extracts.[16] These successful experiments have not been duplicated by other workers and there has been no human application to date. Many other attempts to prolong homograft survival have been made, including radiation of donor and host[17] and the administration of cortisone and ACTH.[18] Some prolongation of graft survival has been obtained in isolated instances, but no permanent survivals have been recorded.

One of the most fascinating aspects of "acquired tolerance" is the demonstration that injection of normal tissues *in utero* in mice will render the fetus "tolerant" not only to tissue from the donor mice strain, but their tumors as well.[19] Although our goals in cancer and homograft research are opposite—with permanent survival sought after in one case and total rejection in the other—these techniques offer a promising approach to unraveling the biologic differences between tumor and normal tissue. It is indeed likely that significant advances in one area will lead to similar progress in the other.

References

1. Merrill, J. P.; Murray, J. E.; Harrison, J. H.; and Gurd, W. R.: Successful homotransplantation of the human kidney between identical twins. J.A.M.A., 140:277-282, 1956.
2. Sterling, J. A., and Goldsmith, R.: Total transplant of thyroid gland using vascular anastomoses. Surgery, 35:624-28, 1954.
3. Broster, L. R., and Gardiner-Hill, H.: A case of Addison's disease successfully treated by a graft. Brit. M.J., 2:570-572, 1946.
4. Bollag, W.S.: Demonstration of antibodies following homografts. Transplantation Bull., 3:43-44, 1956.
5. Medawar, P. B.: The behavior and fate of skin autografts and skin homografts in rabbits. J. Anat., 78:176-199, 1944.
6. Dempster, W. J.: Kidney homotransplantation. Brit. J. Surg., 40:447-465, 1953.
7. Hardin, C. A.: Common antigenicity between skin grafts and total lung transplants. Transplantation Bull., 3:45-46, 1956.
8. Medawar, P. B.: Immunity to homologous grafted skin; the fate of skin homografts transplanted to the brain, to subcutaneous tissue, and to the anterior chamber of the eye. Brit. J. Exper. Path., 29:58-69, 1948.
9. Hume, D. M., and Egdahl, R. H.: Progressive destruction of renal homografts isolated from the regional lymphatics of the host. Surgery, 38:194-214, 1955.
10. Billingham, R. E.; Brent, C.; and Medawar, P. B.: Active acquired tolerance of foreign cells. Nature, 172:603-606, 1953.
11. Woodruff, M. F. A., and Simpson, L. R.: Induction of tolerance to skin homografts in rats by injection of cells from the prospective donor soon after birth. Brit. J. Exper. Path., 36:494-499, 1955.
12. Koprowski, H.: Actively acquired tolerance to a mouse tumor. Nature, 175:1087, 1955.
13. Gross, L.: Susceptibility of newborn mice of an otherwise apparently "resistant" strain to inoculation with leukemia. Proc. Soc. Exper. Biol. & Med., 73:246-248, 1950.
14. Aust, J. B.; Martinez, C.; Bittner, J.; and Good, R. A.: Tolerance in pure strain newborn mice to Tumor homografts. Proc. Soc. Exper. Biol. & Med., 92:27-29, 1956.
15. Good, R. A., and Varco, R. L.: Successful homograft of skin in a child with agammaglobulinemia. J.A.M.A., 157:713, 1955.
16. Hardin, C. A., and Werder, A. A.: A one-year study of surviving homografted mouse skin. Plast. & Reconstruct. Surg., 15:107-113, 1955.
17. Dempster, W. J.; Lennox; and Boag, I. W.: Prolongation of survival of skin homotransplantation in the rabbit by irradiation of the host. Brit. J. Exper. Path., 31:670, 1950.
18. Baker, R.; Gordon, R.; Huffer, J.; and Miller, F. H.: Experimental renal homotransplantation. I. Effect of nitrogen mustard, cortisone and splenectomy. Arch. Surg., 65:702, 1952.
19. Koprowski, H.; Theis, G.; and Love, R.: Transplantation Bulletin, 3:55, 1956.

Comparative Effectiveness of a Weighed Reduction Diet and an Approximate-Measure Diet

RUTH E. FRANKLIN, B.S., M.N.S.
EDWARD H. RYNEARSON, M.D.
Rochester, Minnesota

DIETS restricted in calories to bring about reduction of weight in obese persons may be divided into two categories, namely, a weighed diet that requires use of gram scales to measure the allotment of food and a diet that requires only approximate measure of the food.

Some authorities continue to recommend the weighing of food in a diet that is restricted in calories. Evans and Strang,[1] in 1929, considered that the same metabolic insight should be used in the dietary treatment of obesity as in the dietary treatment of diabetes. Wilder[2-4] stated that a diet for reduction of weight demands the same attention to quantitative considerations as does a diet for diabetes and that for a time, at least, the patient should be required to weigh his food. Newburgh[5] said that reduction diets should be weighed, and Barborka[6] stated that a diet prescribed for the more resistant types of obesity should be accurately weighed. Meiklejohn[7] considered it best that all foods be weighed in restricted-calorie diets, at least at first.

Since the early 1930's, most reduction diets of less than 1,000 calories have been weighed for patients at the Mayo Clinic. Those for whom such a diet has been ordered have been taught to weigh their food if they are to continue with the diet at home. They must have at least three, and usually four, consultations with the dietitian. Those not required to weigh their food and who use approximate measures have only one consultation with the dietitian. Thus, much more time is devoted to instruction of the person who is to follow the weighed reduction diet.

The purpose of the present study is to compare the loss of weight of obese patients instructed in a weighed reduction diet with that of patients instructed in an approximate-measure reduction diet.

Selection of Patients

It was decided to select the persons for this study from those who had been instructed two years previously (1953). This was to allow sufficient time for grossly overweight persons to have reached their ideal weights. Also, by such a lapse of time, differences in loss of weight due to differences in caloric levels of the reduction diets would tend to have been cancelled. In order to have at least 100 persons in the group for weighed reduction diets, it was necessary to include a few who had received instructions three years previously. Therefore, all patients who had received instructions in the weighed reduction diet in 1953 and a few obtained at random from the 1952 group were included. None of these patients had required special features in the reduction diet, such as restriction of sodium or of residue. There were 103 persons in this group. The diet contained 624 calories, with 62.5 gm. of protein, 17.5 gm. of fat and 54 gm. of carbohydrate.

A random sample was made of the patients who had received instructions in 1953 in the diets using approximate measures; those receiving reduction diets with special features were excluded. There were 102 patients in this group. The diets ranged in calories from 800 to 1,500. The "800-calorie" diet contained 67 gm. of protein, 24 gm. of fat and 76 gm. of carbohydrate, providing a total of 788 calories. The "1,000-calorie" diet contained 71 gm. of protein, 39 gm. of fat, 97 gm. of carbohydrate and 1,023 calories. The "1,200-calorie" diet contained 71 gm. of protein, 53 gm. of fat, 112 gm. of carbohydrate and 1,209 calories. The "1,500-calorie" diet contained 73 gm. of protein, 76 gm. of fat, 132 gm. of carbohydrate and 1,504 calories.

None of these patients had been told that they

Miss Franklin is a dietitian at the Mayo Clinic, and Dr. Rynearson is in the Section of Medicine, Mayo Clinic and Mayo Foundation, Rochester, Minnesota.

The Mayo Foundation, Rochester, Minnesota, is a part of the Graduate School of the University of Minnesota.

would be contacted at a future date and questioned about their weight; such action had not been contemplated at the time they were receiving dietary instructions.

Contact of Selected Patients

Since most of the patients were not local residents, it was not feasible to examine them personally. Therefore, questionnaires were mailed to all persons. The response was poor, about 25 per cent of each group returning them. Those patients failing to respond received a second questionnaire two months later, and a third attempt was made after another lapse of two months. After the third questionnaire had been sent, we had replies from forty-nine of the 103 patients in the group using weighed reduction diets and fifty-six of the 102 patients using approximate-measure diets. This constituted about a 50 per cent response for each group.

Characteristics of Patients

Of the forty-nine patients instructed in the weighed diet, seven were male and forty-two were female. Of the fifty-six patients instructed in the approximate-measure diet, twenty-three were male and thirty-three were female. The ages in the former group ranged from fifteen to seventy-six years, with thirty of the patients in the range of forty to sixty years. The patients using approximate-measure diets ranged from twenty to eighty years of age, with thirty-one in the range of forty to sixty years. Thirty-six of the weighed-diet group and forty-six of those using approximate-measure diets were married.

Nine of the patients using weighed reduction diets and ten of those using approximate-measure diets had a diagnosis of possible psychologic problems at the time of their medical examination.

The ideal weight for each person was determined and recorded by the physician at the time of his examination. The ideal weight was calculated from either the Metropolitan Ideal Weight Tables or the Medico-Actuarial Mortality Investigation Tables of 1912.

Initial Overweight.—The patients taught the weighed diet were much more overweight than were those taught the approximate-measure diet. Initially, the former patients were twenty-six to 202 pounds above ideal weight, with an average of eighty-two pounds. This was 17 to 155 per cent above ideal weight, with an average of 57 per cent.

The patients using the approximate-measure diet were initially six to 132 pounds above ideal weight, with an average of thirty-five pounds. This was 4 to 102 per cent above ideal weight, with an average of 25 per cent.

Results

Least Weight.—At the time when they weighed the least, the patients using the weighed diet ranged from thirteen pounds below ideal weight to 103 pounds above, with a mean of forty-one pounds above ideal. This range was from —8 to +81 per cent, with a mean of 29 per cent above ideal weight.

The patients using the approximate-measure diet had an average least weight that was seventeen pounds above ideal weight, with a range of eight pounds below and seventy pounds above ideal. This range was —5 to +58 per cent, with a mean of 12 per cent above ideal weight.

Present Weight.—At their present weights (1955), the patients who had been taught the weighed diet averaged fifty-eight pounds above ideal weight, with a range of seven pounds below to 160 pounds above ideal. This was —5 to +114 per cent above ideal weight, with an average of 41 per cent above ideal.

The patients using the approximate-measure diet averaged twenty-four pounds above ideal weight, with a range of three pounds below to eighty pounds above ideal. The average was 17 per cent above ideal weight, with a range of —2 to +67 per cent above ideal.

Time Required to Attain Least Weight.—The patients were asked the date at which they weighed the least. Approximately half of them failed to give this date; of those who did, nearly one third in each group attained their least weight within 6 months from the time they received their diet instructions. The others reached their least weight six months to two years after they had received instructions.

Vitamin Supplements.—All patients instructed in a reduction diet were given routinely a vitamin supplement that conformed to the hexavitamin capsule of the Pharmacopeia of the United States. Those on the weighed reduction diet and the 800-calorie approximate-measure diet were advised to take one capsule daily; all others were advised to take one capsule every other day. It was thought at one time that excessive eating by some persons might be explained by an unconscious effort to secure adequate vitamins.[4] Approximately 90 per cent of the patients in each group reported that they had taken the prescribed vitamin supplement.

Medications.—The patients were not advised to take medications designed to control the appetite or to increase metabolism. When asked if they had taken such medications, an insignificant number in either group indicated that they had done so. Only three patients in the group using weighed diets and one of those using the approximate-measure diets took thyroid. One patient using the weighed diet took medication designed to control the appetite.

Effect of Diet.—The patients were asked if they noticed any special effect of the diet. Thirteen of those using weighed diets and fourteen in the approximate-measure group had no comment. Ten patients using weighed diets reported "no effect," nine stated they felt better and two reported feeling hungry. Eleven patients using approximate-measure diets reported "no effect," seven felt better and three felt hungry.

Comment

As already noted, the response to the questionnaire regarding loss of weight was poor, only 50 per cent of the patients responding. We think that a larger percentage might have responded if the patients had been told at the time they had instructions in diet that they would be receiving such a questionnaire. We have no means of determining the reason for failure of response by half the patients. Those who did not respond were no more overweight initially than were those who did reply. They may have failed to reply because of poor performance and failure to lose weight. However, some of those who replied had failed to lose weight and some indicated a gain in weight.

More female patients than male were taught the weighed reduction diet, about 80 per cent of this group being female. This preponderance of the female sex has been observed by others working with obese patients.[8-12] The proportion of men to women in the group using the approximate-measure diet was more even, 41 per cent being men and 59 per cent women. Perhaps fewer men were included in the weighed-diet group because they often are obliged to eat one or more meals away from home, making it impractical for them to follow a weighed diet.

More than half of the patients in each group were in the age range of forty to sixty years. This is to be expected, since many people have a tendency to gain weight after reaching middle age.

This study may have included two different population groups, as the patients who were taught the weighed reduction diet were considerably more overweight initially than were those taught the approximate-measure diet. However, the former group showed a greater loss of weight than did the latter. At the time of least weight, the former group had lost an average of 41 pounds as compared to an average loss of 18 pounds for those using the approximate-measure diet.

At the time of completion of this study, the patients taught the weighed diet showed a slightly better performance than did those using the approximate-measure diet. The former group had lost an average of 24 pounds as compared to an average loss of eleven pounds for the patients taught the approximate-measure diet.

Those patients using the weighed diet who regained weight regained an average of 17 pounds, whereas those using the approximate-measure diet showed an average regain of 7 pounds. With a longer lapse of time, it is possible that even more weight might be regained by both groups.

The ultimate goal in a program of weight reduction is to have the obese person reach his ideal weight. This may be expecting a great deal in some cases, but it is still the goal. Of the two groups in our study, fewer of the patients using weighed diets were within 10 per cent of ideal weight at the completion of the survey; five (10 per cent) of those in the weighed-diet group had achieved this loss, as compared with nineteen (34 per cent) of those using the approximate-measure diet.

As mentioned previously, nearly one third of the patients in each group who indicated the date at which they attained their least weight had attained such weight within six months after receiving diet instructions. This would indicate that a follow-up within six months after instruction might give the patient further incentive to continue the program of weight reduction.

Some investigators[13-15] consider that a reduction diet low in fats may be conducive to hunger. The reduction diets, with the exception of the 1,500-calorie diet, used by our patients may be classified as low in fat, but only two persons using the weighed diet and three using the approximate-measure diet reported feeling hungry.

Summary and Conclusions

A comparative study was made at the Mayo Clinic of questionnaire data regarding loss of weight received from forty-nine patients who had been taught to use a weighed reduction diet and from fifty-six patients who had been taught to use an approximate-measure reduction diet.

The patients using the weighed diet lost a greater number of pounds than did those using the approximate-measure diet. However, fewer of the patients using weighed diets attained weights within 10 per cent of their ideal weight than did those using the approximate-measure diet.

Whether a weighed reduction diet or an approximate-measure reduction diet is prescribed depends on the immediate objective with regard to the person concerned. If the objective is the loss of as great an amount of excess weight as possible without necessarily attaining ideal weight, the weighed reduction diet would be indicated. Otherwise, it is optional as to which of these two types of diet is prescribed. In view of the fact that more time must be spent with the patient to teach him the weighed reduction diet, it would appear more practical to use the approximate-measure reduction diet.

No matter what type of reduction diet may be used, follow-up of the patients at intervals of six months is advisable. Perhaps this would encourage them to continue reduction of weight until the ultimate goal of ideal weight has been reached.

Too few patients reported failure to take vitamin supplements to justify any conclusions about the possible effect such failure might have on the success or lack of success in reduction of weight. The few patients who did not take vitamin supplements were neither more nor less successful than were those who did take them. Similarly, no conclusions may be drawn as to the effect of medications designed to control the appetite or to increase metabolism.

Only two of the forty-nine patients using weighed diets and three of the fifty-six patients using approximate-measure diets reported they were hungry while following the diets.

References

1. Evans, F. A., and Strang, J. M.: Departure from usual methods in treating obesity. Am. J. M. Sc., 177:339-348 (Mar.) 1929.
2. Wilder, R. M.: The management of obesity. J. Am. Dietet. A., 6:91-100 (Sept.) 1930.
3. Wilder, R. M.: The significance of diet in treatment. J.A.M.A., 97:435-436 (Aug. 15) 1931.
4. Wilder, R. M.: The treatment of obesity. Internat. Clin., 4:1-21 (Dec.) 1933.
5. Newburgh, L. H.: Obesity. Arch. Int. Med., 70: 1033-1096 (Dec.) 1942.
6. Barborka, C. J.: Present status of obesity problem. J.A.M.A., 147:1015-1019 (Nov. 10) 1951.
7. Meiklejohn, A. P.: Diet and obesity. Proc. Nutritional Soc., 12:19-24, 1953.
8. Bayer, Leona M., and Gray, H.: Obesity treatment by diet, thyroid and dinitrophenol: Result on 106 outpatients. Am. J. M. Sc., 189:86-91 (Jan.) 1935.
9. Gray, Horace, and Kallenbach, Dorothy E.: Obesity treatment: Results on 212 outpatients. J. Am. Dietet. A., 15:239-245 (Apr.) 1939.
10. Danowski, T. S., and Winkler, A. W.: Obesity as a clinical problem. Am. J. M. Sc., 208:622-630 (Nov.) 1944.
11. Adlersberg, D., and Mayer, M. E.: Results of prolonged medical treatment of obesity with diet alone, diet and thyroid preparations, and diet and amphetamine. J. Clin. Endocrinol., 9:275-284 (Mar.) 1949.
12. Llewellyn, J. S.; Bennett, Emily; Hurley, Mary M.; and Neff, Mildred: A weight control program at the local level. Am. J. Pub. Health, 43:433-437 (Apr.) 1953.
13. Cederquist, D. C.; Brewer, W. D.; Beegel, R. M.; Wagoner, A. N.; Dunsing, D.; and Ohlson, M. A.: Weight reduction on low-fat and low-carbohydrate diets. I. Clinical results and energy metabolism. J. Am. Dietet. A., 28:113-116 (Feb.) 1952.
14. Young, Charlotte M.: Weight reduction using a moderate-fat diet. I. Clinical responses and energy metabolism. J. Am. Dietet. A., 28:410-416 (May) 1952.
15. Ohlson, Margaret A.; Brewer, Wilma D.; Kereluk, Deloris; Wagoner, Andrea; and Cederquist, Dena C.: Weight control through nutritionally adequate diets. In: Weight Control: A Collection of Papers Presented at the Weight Control Colloquium. Ames: The Iowa State College Press, 1955, pp. 170-187.

Case Presentation

Renal Artery Aneurysm Causing Malignant Hypertension

ROBERT C. DAVIDSON, M.D.
JOHN I. COE, M.D.
Minneapolis, Minnesota

PARTIAL obstruction of the renal artery blood flow to one kidney has been demonstrated experimentally to produce hypertension[1] and clinical cases secondary to unilateral renal artery disease have been described. However, only recently have the clinical symptoms and successful treatment of such cases been stressed. Certain clinical features may be easily misinterpreted if the correct diagnosis is not entertained; on the other hand, if the entity is suspected, diagnosis of unilateral renal artery disease may be made by established techniques, and relief of the hypertension frequently can be obtained by surgery.

The following case is reported to emphasize the possibility of hypertension resulting from unilateral renal artery disease and the misinterpretation of routine renal tests which may occur in such cases.

Case History

D. P., a forty-seven-year-old white woman, was first admitted to a private hospital on October 20, 1955, because of myomata of the uterus associated with menstrual irregularities and lower abdominal discomfort. Past history was normal except for a cholecystectomy in 1950. On admission the blood pressure was 138/80 mm. Hg. Urinalysis was normal with a specific gravity of 1.016. An electrocardiogram was normal. Abdominal hysterectomy and bilateral partial oophorectomy were performed without incident, but four days later the patient developed small bowel obstruction. At laparotomy a fibrous band was found and, when this had been severed, the obstruction was relieved. Her blood pressure prior to the second procedure was 136/70 mm. Hg. Postoperatively, she was given three units of whole blood within a week for episodes of hypotension. The lowest recorded blood pressure was 90/58 mm. Hg. The last blood pressure recorded during this admission was 130/90 mm. Hg., on November 4, 1955. The hospital course was otherwise complicated by a severe sore throat and pneumonia of the right mid-lung field, which cleared with antibiotics. She was discharged in the latter part of November, 1955.

Subsequently, she had a recurrent sore throat and increasingly severe, throbbing headaches which radiated from the occiput to the eyes. She also noted blurred vision and occasional nausea.

On January 27, 1956, the patient vomited after a severe headache, lost consciousness, fell, and lacerated her scalp. She was readmitted to the private hospital and shortly thereafter had a grand mal convulsion. The blood pressure was now 224/130 mm. Hg., the pulse rate was 96 per minute, and the temperature was 98.6°F. She was confused and disoriented. Severe papilledema and bilateral Babinski signs were noted. Neurologic examination was otherwise normal. Examination of the lungs, heart, and abdomen was not remarkable. The hemoglobin was 15.6 grams per cent. The initial white blood count was 23,000 per cu. mm. with 89 per cent neutrophils and 11 per cent lymphocytes, but was normal three days later. Urinalysis revealed 4+ albuminuria, 1-4 red cells and 3-5 pus cells per high power field. Specific gravity was 1.015. A lumbar puncture was done shortly after admission and the pressure was found to be 360 mm. of cerebrospinal fluid. The spinal fluid contained no cells, the protein was 20 mg. per cent, and the sugar was 37 mg. per cent. Culture was negative. Spinal fluid on two subsequent examinations was also normal. Blood urea nitrogen was 18 mg. per cent. Further examinations of the urine disclosed a 1-2+ albuminuria, occasional to 150 red cells per high power field, and specific gravities from 1.007 to 1.020.

Chest x-ray revealed the heart to be at the upper limits of normal in size. An excretory urogram on February third showed good concentration of dye bilaterally and was interpreted as normal. Skull x-rays were normal. A Regitine test was normal. The patient became more alert and was thought to have improved clinically although the headaches persisted and the blood pressure ranged from 200/120 to 240/140 mm. Hg. Papilledema was marked and showed no improvement.

Hypertensive encephalopathy was considered the most likely diagnosis; however, on February 10, 1956, she was transferred to the Neurology Service of Minneapolis General Hospital, since brain tumor had not been excluded and ventriculography had, therefore, been recommended.

The blood pressure on admission was 240/120 mm. Hg. The pulse rate was eighty per minute and regular.

From the Department of Pathology, Minneapolis General Hospital, Minneapolis, Minnesota.

Dr. Davidson's present address is Department of Medicine, University of Washington and Veterans Hospital, Seattle 8, Washington.

She was thin, well developed, and alert, with a height of 150 cm. and weight of 110 pounds. Funduscopic examination revealed indistinct disc margins, marked arteriolar narrowing and spasm with arterior-venous compression; flame-shaped hemorrhages were noted in the right fundus. Examination of the remainder of the head and neck revealed no abnormality. The thyroid was not enlarged. The lungs were clear. The heart was enlarged, its apical impulse was felt at the anterior axillary line in the left fifth interspace. A grade II systolic murmur was heard at the apex and at the aortic area. The remainder of the examination, including the neurologic study, was normal. Toe signs were absent.

A serologic test for syphilis was negative. The hemoglobin and white blood cell counts were normal. Several urinalyses revealed albumin varying from a trace to 1+, red blood cells from 1 to 200, and leukocytes from 2-4 per high power field. The maximum specific gravity was 1.024. Blood urea nitrogen was 8 mg. per cent. Spinal fluid pressure was 410 mm. of cerebrospinal fluid and the fluid was normal. Electrocardiogram now showed flat to inverted T waves in 1, AVL, V1 through V6 with depression of the ST segment in V6. Intramuscular and intravenous Regitine tests were normal.

The fluid intake was 1200 cc. to 3500 cc. and the urine output 500 to over 1000 cc. daily. The hospital course was characterized by increasing signs of cerebral irritation and severe hypertension despite anti-hypertensive drugs.

On the sixth hospital day ventriculography was done, but no abnormality of the ventricular system was noted. Following this, the patient became intermittently lethargic. She developed mild nuchal rigidity and another lumbar puncture now revealed grossly bloody fluid. Her course was afebrile. A lumbar puncture and cisternal puncture gave temporary improvement in consciousness but she finally lapsed into coma and developed Babinski signs. Cheyne-Stokes respirations were followed by cessation of breathing, but the patient was maintained for an additional seven hours in a Monahan respirator. She expired on the tenth hospital day.

Autopsy

Autopsy was performed eleven hours after death and no gross abnormalities of the lungs, liver, gallbladder, spleen, gastrointestinal tract, pancreas, adrenals, organs of the neck or muculoskeletal system were noted.

The heart showed moderate left ventricular hypertrophy, weighing 335 grams with the left ventricle measuring 16 mm. in thickness at the base. No abnormalities of the valves, coronary arteries, or myocardium were noted.

The left kidney weighed 140 grams, the right 100 grams. The capsules of both kidneys stripped with ease revealing smooth external surfaces, but the right kidney showed a yellowish mottling. On section normal gross architecture was seen in both kidneys with the corticomedullary junction distinct throughout. The left renal cortex measured 8 mm. in thickness compared with 6 mm. for the right kidney. There was an irregular area af hyperemia in the middle of the right kidney. The kidney pelves, ureters, and urinary bladder were all normal. The left renal artery and vein were normal. Midway between the origins of the right renal artery and the renal pelvis a saccular aneurysm of this artery was found which measured approximately 1.5 x 1 x 1 cm. in size. This was filled with a partially organized, laminated clot and compressed the renal artery at the site of the aneurysm to a diameter of 3 mm. The uninvolved portion of this artery was somewhat smaller in diameter than was the left renal artery. The aorta showed moderate atherosclerosis but neither renal artery was involved.

There was moderate subarachnoid hemorrhage over the basilar portions of the brain and small traumatic hemorrhagic lacerations at the sites of ventriculography. Coronal sections revealed two small linear hemorrhages, one situated above the pyramidal tract medial to the olive on the right side. The second was on the left side 2 mm. from the midline and 4 mm. from the floor of the fourth ventricle near the middle of the reticular formation.

Microscopic examination of the organs showed hyaline arteriolosclerosis in the pancreas, spleen, liver, and meninges. This was in contrast to the kidneys where only minimal arteriolosclerosis was present on either side. Histologically, the left kidney was normal. The right kidney revealed diffuse tubular atrophy. (Figs. 1 and 2.) This was the side supplied by the affected artery and represents classically the histopathology produced by renal ischemia. The glomeruli bilaterally appeared normal.

Comment

In summary a normotensive, forty-six-year-old, white woman had a subtotal hysterectomy and partial oöphorectomy complicated by small bowel obstruction requiring a second operation. This was followed by the onset of severe hypertension producing encephalopathy and death three months later. Clinical investigation during the hypertensive period showed varying degrees of albuminuria, intermittent microscopic hematuria, good urinary concentration, negative Regitine tests, and a normal intravenous urogram. Ventriculography was performed to exclude brain tumor. Autopsy revealed a thrombosed aneurysm constricting the right renal artery.

The clinical diagnoses considered were acute glomerulonephritis, essential hypertension, brain tumor, pheochromocytoma, and unilateral renal disease. Unilateral renal disease seemed excluded by the normal intravenous urogram and the correct diagnosis was not established prior to the autopsy. The inconsistencies with the considered diagnoses of glomerulonephritis or of essential hypertension were not appreciated until review of the problem.

Discussion

Sporadic instances of obstructive lesions of the renal artery have been reported and the literature was extensively reviewed in 1944 by Yuile.[2] More recently, hypertension resulting from this condition has been emphasized by Poutasse[3] who reviewed the literature, discussed the pathology, and described the salient clinical and diagnostic features. He has also reported four additional patients, in three of whom the hypertensive vascular disease was relieved by nephrectomy.[4]

Yuile and Poutasse both point out that obstructive renal artery lesions may result from extrinsic compression or intrinsic arterial disease. The former, usually due to tumor or aortic aneurysm, is rare. Intrinsic arterial disease may result from thrombosis, developmental defects, embolus, arteriosclerotic plaques, syphilitic arteritis, or, as in the above described case, eneurysm of the renal artery.

A case of renal artery aneurysm causing unilateral renal ischemia and hypertension by obstruction of the renal artery was recently reported by Pastor et al.[5] In their case an intravenous urogram was normal, but the diagnosis of renal artery aneurysm was established by translumber aortography. Following nephrectomy the hypertension disappeared.

The histopathologic findings of experimental and clinical unilateral ischemia of the kidney have been described by Bell.[6] The ischemic kidney shows tubular atrophy. In three cases reported by Laforet[7] there was benign arteriolosclerosis and tubular atrophy in the affected kidney and necrotizing arteriolitis in the opposite kidney. In one of the cases hypertension had been present four months, in another it had been present three years, and in the third the duration of the hypertension was not known. In the case of Pastor et al, tubular atrophy was noted but arteriolar changes were not mentioned. Hypertension had been present at least three years. In one of Poutasse's cases, ischemic and normal renal tissue were present in the same kidney, ischemia being manifested by tubular atrophy. Arteriolosclerosis was only moderate.

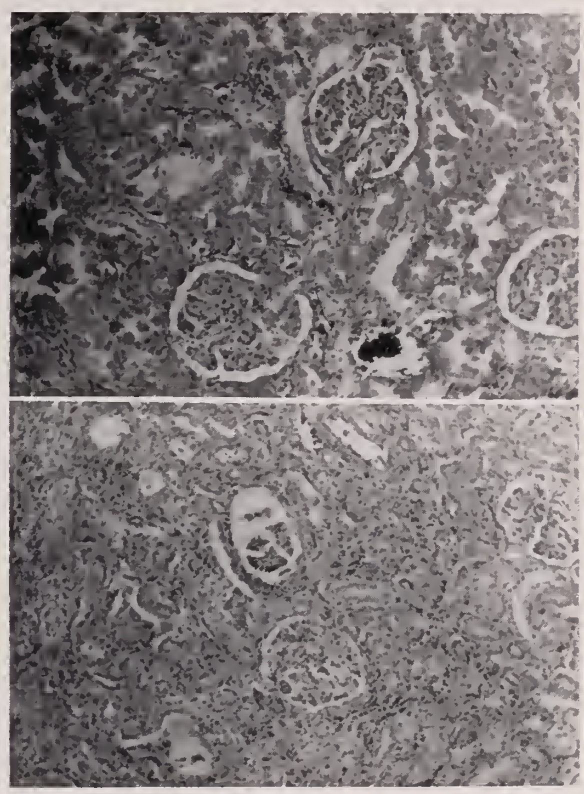


Fig. 1. *(Above)* Left kidney, normal. *(Below)* Right kidney, showing diffuse tubular atrophy.

Our case showed tubular atrophy in the ischemic kidney in marked contrast to the normal appearance of the unaffected kidney. Renal arteriolar lesions, however, were not remarkable in either kidney in spite of an accelerated course with death due to hypertensive encephalopathy. The renal artery aneurysm only partially obstructed the renal artery and no accessory or aberrant branches were found. It is to be emphasized that hypertension develops only when the renal blood supply is diminished. Complete infarction of a kidney does not produce prolonged high blood pressure.

It is interesting that in our case and in one of the cases reported by Poutasse in which the main renal artery was thrombosed, the hypertension and presumably the thrombosis developed postoperatively. In both, this followed abdominal complications. The significance of this relationship is not known, but it is conjectured that the thromboses in these cases have been due in part to transient hypotension in abnormal renal arteries.

We believe that one of the most important points in the clinical study of this patient was the intravenous urogram which showed good excretion bilaterally and which appeared normal. That the intravenous urogram may be essentially normal or only minimally altered in spite of serious arterial obstruction has also been pointed out by Poutasse. When renal hypertension is suspected and intravenous urography is not remarkable, the comparison of urine samples from both kidneys by ureteral catheters may be an important clue. The involved kidney shows delayed excretion of indigo carmine and other dyes with reduced osmolarity of the urine. Translumber aortography should then be done to demonstrate the renal artery lesion. Surgery is the definitive treatment for this form of hypertension.

Summary

1. The clinical and pathologic findings in a patient with malignant hypertension due to unilateral renal ischemia from a thrombosed renal artery aneurysm are reported.

2. Correct diagnosis in this and some of the other reported cases was impeded by normal intravenous urograms. Other investigators have shown that antemortem diagnosis of this condition may be accomplished by comparison of urine samples from each kidney and translumber aortography.

References

1. Goldblatt, H.: Experimental renal hypertension. Am. J. Med., 4:100, 1948.
2. Yuile, C. L.: Obstructive lesions of the main renal artery in relation to hypertension. Am. J. M. Sci., 207:394, 1944.
3. Poutasse, E. F., and Dustan, H.: Hypertension due to renal artery lesions. Cleveland Clin. Quart., 23:3, 1956.
4. Poutasse, E. F.: Occlusion of the renal artery as a cause of hypertension. Circulation, 12:37, 1956.
5. Pastor, B. H.; Myerson, R. M.; Wohl, G. I., and Rouse, P. V.: Hypertension associated with renal artery aneurysm and relieved by nephrectomy. Ann. Int. Med., 42:1122, 1955.
6. Bell, E. T.: Renal Disease. Philadelphia: Lea and Febiger, 2nd ed. 1950, p. 384.
7. Laforet, E. G.: Malignant hypertension associated with unilateral renal artery occlusion: Three cases. Ann. Int. Med., 38:667, 1953.

ASSESSING DRUG THERAPY IN PARKINSONISM

(Continued from Page 660)

Summary

A clinical method for assessing drug therapy in Parkinsonism has been devised. All drugs to be assessed in the treatment of Parkinsonism are delivered to the dispensary without ever having been seen by the doctor, who is to conduct the study. Here numbers are assigned to the drug and to a placebo. The key to the identity of the drugs is not disclosed until the final assessment is made at the end of a six-month period. One physician prescribes the numbered compounds to alternate patients, and he alone sees these patients during the period of study. A minimum of twenty cases is necessary for the study of a single new drug—ten receiving the placebo and ten the active compound. By this method, the objectivity of the examiner is assured. In addition, the effect of the new drug can be compared with that of the placebo, as well as with the previous medications the patient has received.

The psychologic factors in assessing drug therapy in Parkinsonism are important. Three patients while receiving placebos achieved a good therapeutic effect for a period of one to four months.

References

1. Duff, R. S.: Use of Diparcol in Parkinsonism. Brit. M. J., 1:613, 1949.
2. Sigwald, J.; Bovet, D.; and Dumont, G.: Le traitement de la maladie de Parkinson par le chlorhydrate de diéthylaminoéthyl-N-thiodiphénylamine (2987 R.P.), premiers résultants. Rev. Neurol., 78:581, 1946.
3. Sigwald, J., Grossiord, A., et al.: Le traitement de la maladie de Parkinson et des manifestations extra pyramidales par le diéthylaminoéthyl-N-thiodiphénylamine (2987 R.P.), resultats d'une année d'application. Rev. Neurol., 79:683, 1947.
4. Budnitz, J.: Use of Benadryl in Parkinson's disease; preliminary report of eight cases. New England J. Med., 238:874, 1948.

Continuation Studies

Acute Cholecystitis and Choledocholithiasis

GEORGE S. BERGH, M.D.
Minneapolis, Minnesota

VARIOUS etiologic factors, mechanical, chemical and bacteriologic, may contribute to the production of acute cholecystitis. In most cases the mechanical factor—obstruction of the outlet of the gallbladder—is the precipitating mechanism. If the function of the gallbladder has been disturbed so that absorption is inhibited to the extent that the volume of secretion exceeds absorption, distention of the gallbladder will occur. If distention is rapid, acute cholecystitis will result, and if the blood flow to the organ is compromised sufficiently, areas of gangrene and perforation may develop.

Even though mechanical factors precipitate the acute cholecystitis, infection often supervenes, and as time passes the infectious component becomes more and more important.

Acute cholecystitis may occur during acute infectious diseases, such as typhoid fever. In such instances, the mechanical factor is probably unimportant.

The clinical picture is variable, the symptoms being usually more severe in cases in which the cystic duct is occluded. In obstructive acute cholecystitis the onset is often sudden and the pain may be severe. The pain may consist of a continuous ache or a colicky pain in the epigastrium or right hypochondrium, frequently with radiation to the right subscapular or interscapular region. It is often associated with nausea and vomiting. There is muscle spasm and tenderness in the right upper abdominal quadrant and the gallbladder is sometimes palpable. Chills and fever and an elevated leukocyte count may be present, and there may be slight jaundice.

Some of the conditions from which acute cholecystitis must be differentiated include perforated gastric or duodenal ulcer, intestinal obstruction, appendicitis, coronary heart disease, pancreatitis, hepatitis, renal or ureteral calculus, and mesenteric thrombosis.

Most clinicians will agree that the rare case of purely infectious acute cholecystitis, such as seen in patients with typhoid fever, should be treated medically during the acute phase of the disease. But there is still no agreement concerning the best treatment of the ordinary acute obstructive cholecystitis. Some surgeons believe that it should be treated conservatively during the acute phase and that operation should be deferred until it may be performed during a quiescent stage. Others favor early operation whenever possible.

Surgeons who favor conservative therapy point out that very few cases of acute cholecystitis fail to subside under proper medical therapy. Delay also permits complete diagnostic studies and consequently less frequent diagnostic errors. It also permits elective operation when the patient is in the best possible condition.

Conservative therapy does not mean neglect. Active therapy is mandatory. In the case of acute cholecystitis, movement of the diaphragm, gallbladder and gastrointestinal tract are unfavorable influences. The withholding of food removes stimulation of gallbladder activity and the diaphragm is splinted reflexly. Even under a regimen of starvation, however, intestinal activity is required to propel the large volume of secretions which are poured into the upper portion of the alimentary canal. The employment of continuous suction applied to an inlying duodenal tube helps to overcome this influence.

Pain sometimes may be relieved by drugs which cause smooth muscle relaxation, such as amyl nitrite, but more often morphine or a similar drug will be required. Morphine and related drugs cause contraction of the smooth muscle of the gallbladder and sphincter of Oddi, and for that reason their use should be avoided if possible. General supportive measures are also employed.

Since infection may become important even in obstructive cholecystitis, antibiotics are usually employed. Antibiotics are excreted in the bile. They do not reach the gallbladder when the cystic duct is obstructed, but they are useful in

---

Dr. Bergh is Clinical Associate Professor of Surgery, University of Minnesota, and Surgical Consultant, U.S.V.A. Hospitals, Minneapolis, Minnesota.

relation to some of the complications of acute cholecystitis, such as cholangitis and localized or generalized peritonitis.

After subsidence of the acute process, if the gallbladder contains stones, or if it has been so permanently injured that it does not become visible when cholecystography is done, cholecystectomy should be performed.

On the other hand, many surgeons recommend early operation for acute cholecystitis, and when positive diagnosis can be made, we favor this course if the patient can be operated upon within the first seventy-two hours of the disease. Morbidity is decreased by this procedure and complications may be avoided by early operation. Unfortunately, it is often difficult to judge clinically whether the pathologic process is progressing or subsiding, and perforation sometimes occurs with little or no warning. Furthermore, although perforation leads to development of a localized abscess in most instances, perforation into the free peritoneal cavity occurs in about one-fourth of the cases of rupture, and such a development is associated with a high mortality. Early operation eliminates this danger.

If the patient is seen late, however, the infectious component becomes more and more important and operation is accompanied by increased danger. Conservative therapy should be instituted in such cases, and operation should be deferred until the acute process has subsided. There is no sharp dividing line between the time when early operation is better and the time when conservative measures are preferable. A practical working rule is to operate during the first seventy-two hours of the acute disease and to defer operation if the patient cannot be operated upon during that time limit. An exception to this rule is the case in which the process obviously progresses in spite of conservative therapy.

Whether operation be undertaken early or late, the procedure of choice is cholecystectomy, but in some cases a lesser procedure, such as cholecystostomy, is indicated. In any case, if the gallbladder is diseased, operation should not be deferred too long, since procrastination results in sharp increases in mortality rates. Mortality rates multiply quickly as the number of attacks of acute cholecystitis increases. Also in older patients the mortality from acute cholecystitis rises, and in patients over sixty years of age, it is five to ten times the mortality before that age.

In any consideration of this problem one should point out that early cholecystectomy in patients with chronic cholecystitis would minimize the problem of acute cholecystitis as well as the other complications of gallstone disease. Calculous cholecystitis, symptomatic or silent, is a potential hazard, and in the absence of definite contraindications, elective cholecystectomy should be done.

Since at least 10 per cent of patients with acute cholecystitis also have stones within the common duct, the surgeon must consider the indications for choledochostomy at the time of surgery.

There is no clinical picture which indicates positively in all cases whether or not common duct stones are present and decision as to the necessity for common duct exploration requires nice surgical judgment.

There are certain absolute indications for choledochotomy. These include:

1. The discovery by palpation of the duct of any suspicious lump suggesting stone.
2. Visualization of a filling defect suggestive of stone by operative cholangiography.
3. The presence of jaundice or the history of recent jaundice.
4. The presence of clinical cholangiitis.
5. An associated acute pancreatitis. In this case, decompression is accomplished by choledochostomy, but traumatic probing of the lower end of the bile duct must be avoided.

There are also several relative indications for choledochostomy, including: (1) The presence of dilatation of the bile duct or thickening of its wall; (2) The presence of small stones within the gallbladder, especially if the cystic duct is dilated; (3) The presence of a thick-walled, contracted gallbladder; (4) Alteration of the bile in the common duct (obtained by aspiration); and (5) Induration of the head of the pancreas.

If the common duct is opened it should be drained to the exterior postoperatively. Drainage should be continued until the following criteria for removal of the choledochostomy tube are fulfilled.

1. Cholangiographic evidence that the biliary tree is structurally normal, that no filling defects suggestive of stone are present and that the contrast medium empties readily into the duodenum.

(Continued on Page 677)

Current Concepts

Functional Heart Pain

GEOFFREY BOURNE
London, England

The accurate diagnosis of functional heart pain is of paramount importance. Serious organic heart disease and chest pain form such a frequent combination that it is essential to be able to assure nervous patients suffering from functional or harmless chest pain that there is indeed no evidence whatever that their pain is due to organic heart disease. Although an objective differentiation between the two is usually possible, either by the resting cardiogram or by comparison between the resting cardiogram and that taken after exercise, in a small number of cases this means of differential diagnosis is not reliable because organic heart disease can produce coronary pain in hypersensitive patients, the cardiogram remaining normal.

The chief characteristics of functional left chest pain are that it consists of two varieties. One is a heavy submammary fullness or ache, and the other is a sharp stab or prick. They may coexist or they may occur separately. These pains are nearly always felt in the left chest, in the fourth or fifth spaces, usually under the breast. They may be accompanied by the other symptoms of functional heart disease described in the first of these editorials.

The most valuable distinction between functional pain and that of coronary disease is the relation to exercise. Angina of effort is, in any individual case, precipitated by a definite amount of exercise. For example, pain, in one individual, may come on after walking a block, in another after fifty yards, in a third after half a mile. When present it is so increased by further exercise that the patient is forced to stop—frequently to look into a shop window—until the pain after a few minutes passes away. Thus the pain of angina of effort occurs during exertion not after it. Functional heart pain, on the other hand, does not prevent an individual from continuing with exercise already started. Although it is often loosely described as being precipitated by effort, it nearly always is noticed after such effort is finished. Its duration is much longer than that of angina of effort. It may be present for hours or days at a time. A further point of differentiation is the fact that hyperaesthesia of the chest wall is commonly associated with it. This may be general, or localized to one or more spots. It may prevent the patient from sleeping on the left side, or from carrying hard objects in a left breast pocket.

Functional chest pain is most common when the patient is tired or worried. In rare instances the sharp stab or prick is the predominant symptom, and a few cases are on record in whom this sudden stab of pain is immediatedly followed by a fainting attack. The type of individual who is apt to get functional heart pain is the hypersensitive, nervous type, not necessarily suffering from any definite psychiatric disorder. The pain, however, to some extent can be regarded as psychosomatic.

ACUTE CHOLECYSTITIS

(Continued from Page 676)

2. Direct evidence that the sphincter resistance is normal (12 to 17 cm. of water) and that the sphincter is not irritable.

3. Subjective comfort of the patient and lack of drainage around the tube when the drain is clamped.

Conclusion

Acute cholecystitis is a serious disease and constitutes an important cause of death. The incidence of acute cholecystitis can be decreased by earlier operation for chronic gallbladder disease. There is controversy concerning the best treatment of acute cholecystitis, and certainly selection of the proper treatment should be based upon the individual circumstances in each case.

This is the third in a series of articles by Dr. Bourne on heart disease.

Seminar

Reactions to Penicillin

II. The Incidence of Mild Reactions to Procaine Penicillin G in Aqueous Suspension

DONALD J. CORR, M.D.
WILLIAM E. WELLMAN, M.D.
Rochester, Minnesota

THE preparation of penicillin used most frequently for intramuscular administration at this time is the aqueous suspension of procaine penicillin G. Preliminary experience with this agent in 1948 gave indications that it might prove relatively more toxic than the preparation in sesame oil then in common use.[1] Furthermore, Part I of this study revealed that use of the aqueous suspension accounted for more than half of the seventy-four fatal and 176 nonfatal *severe* reactions to penicillin reported in the literature through June, 1954. Therefore, we sought to compare the incidence of *mild* reactions after administration of the sesame-oil agent, as reported in 1948, with the incidence after administration of the same preparation in aqueous suspension in common use during 1952 and 1953 at the Mayo Clinic. The literature concerning mild reactions to penicillin has been reviewed briefly.

Method and Materials

A review was made of the records of 385 patients who received intramuscular injections of procaine penicillin G in aqueous suspension at the Mayo Clinic in 1952 and 1953. The amount of penicillin administered at each injection varied from 300,000 to 1,000,000 units. All of these patients had either nasal or sinus disease and the majority received penicillin prophylactically prior to operation. No other antibiotic was given to this group. None of these patients were known to be sensitive to penicillin prior to the administration of the antibiotic agent at the clinic.

Results

Only four reactions to penicillin were observed in this group of 385 patients. These reactions were all of the mild cutaneous type and all patients recovered rapidly. Data concerning these 385 patients are presented in Table I. Attention is called to the fact that follow-up observations were not made in forty-nine of these patients. It will be noted also that 16.1 per cent of the patients gave histories of asthma, but none of them were known to have experienced a previous re-

TABLE I. DATA CONCERNING 385 PATIENTS RECEIVING PROCAINE PENICILLIN G IN AQUEOUS SUSPENSION

Data		1952	1953	Total	Per Cent
History of asthma		36	27	63	16
Sex	Male	125	97	222	58
	Female	87	76	163	42
History of reaction to penicillin		0	0	0	0
Follow-up after last injection, days	None	26	23	49	
	Less than 8	74	90	164	55
	8-14	32	20	52	
	More than 14	80	40	120	45
Age, years	0-9	11	6	17	4
	10-19	14	9	23	6
	20-29	31	14	45	12
	30-39	53	36	89	23
	40-49	41	40	81	21
	50-59	41	39	80	21
	60-69	19	27	46	12
	70+	2	2	4	1

TABLE II. NUMBER OF INJECTIONS PER PATIENT COMPARED WITH NUMBER OF REACTIONS

Intramuscular Injections*	Patients	Per Cent	Reactions
1	58	15.1	1
2	73	19.0	0
3	144	37.4	2
4	55	14.3	0
5	22	5.7	0
6	13	3.4	1
7	7	1.8	0
8	4	1.0	0
9	2	0.5	0
10+	7	1.8	0
Total	385	100.0	4

*Median number of injections =3.

From the Section of Medicine, Mayo Clinic and Mayo Foundation, Rochester, Minnesota.

The Mayo Foundation, Rochester, Minnesota, is a part of the Graduate School of the University of Minnesota.

TABLE III. INCIDENCE OF REACTIONS TO AQUEOUS PROCAINE PENICILLIN G

Year	Patients	Injections	Reactions		
			Number	Rate by Injections, per cent	Rate by Patients, per cent
1952	212	630	2	0.32	0.94
1953	173	599	2	0.33	1.2
Total	385	1,229	4	0.33	1.0

TABLE IV. COMPARISON OF INCIDENCE OF REACTIONS TO PENICILLIN

Type of Procaine Penicillin Given Intramuscularly	Patients	Reactions	
		Number	Incidence, per cent
Sesame oil (1948)	400	3	0.75
Aqueous (1952-1953)	385	4	1.0
Total	785	7	0.89

TABLE V. REPORTED INCIDENCE OF MILD REACTIONS TO PENICILLIN

Author	Incidence of Reactions, per cent	Route of Administration	Year	Cases	Preparation
Collins-Williams and Vincent[2]	0.6-8.0	Multiple	1953	600	Penicillin, type unknown
Anderson and Keefer[3]	6.0*	Multiple	1945	10,420	Amorphous penicillin
Kuh and Collen[4]	5.1*	Oral	1949	322	Oral penicillin
Kitchen and associates[5]	4.65	Intramuscular	1947	903	Penicillin, type unknown
	3.38	Intramuscular	1950	236	Penicillin, type unknown
Stollerman and Rusoff[6]	2.8	Intramuscular	1952	143	Benzathine penicillin G
Lepper and associates[7]	2.7	Intramuscular	1949	557	Crystalline penicillin in oil and beeswax
	1.4	Intramuscular	1949	148	Procaine penicillin in oil
	1.2	Intramuscular	1949	598	Aqueous crystalline penicillin
Wellman and Herrell[1]	0.75	Intramuscular	1948	400	Procaine penicillin in sesame oil
Bernstein and associates[8]	0.6	Oral	1953	5,500	Oral penicillin
	0.2	Oral	1953	19,000	Oral penicillin
Simon[9]	0.2	Intramuscular	1952	1,237	Crystalline penicillin with tripelennamine

*Adjusted incidence of reactions.

action to penicillin. Table II compares the number of reactions to penicillin with the number of intramuscular injections of the drug given to each patient. As shown in Table III, the incidence of reactions after the intramuscular administration of procaine penicillin G in aqueous suspension was 1 per cent. That this incidence of reactions compares favorably with the incidence of 0.75 per cent reported in 1948 after use of procaine penicillin suspended in sesame oil is clear from the data presented in Table IV. This table further demonstrates that a total of 785 patients observed in these two studies received penicillin suspended in one of the afore-mentioned vehicles, with an over-all incidence of reaction of 0.89 per cent.

Comments

Table V summarizes a brief review of the literature concerning the incidence of mild reactions to penicillin. Wide variation is noted in the reported incidence of these mild reactions. It is difficult to determine what causes this wide variation; it may be due to the fact that certain variables that may influence the incidence of reactions are not always reported. Some of these factors include the type of penicillin administered, the route of administration, the patient's previous experience with penicillin, the period of observation, the patient's allergic status and the definition of a reaction to penicillin.

As noted in Table I, forty-nine of the 385 patients in this study did not continue under observation after receiving penicillin. Therefore, the incidence of reactions to penicillin in this study would increase from 1 to 1.2 per cent when these patients are removed from the total. In concluding that the incidence of mild reactions to the aqueous suspension was about the same as reported in 1948 for the sesame-oil preparation, we have assumed that the two studies also have about the same characteristics as are detailed in Tables I and II.

It is frequently stated that reactions to penicillin are more likely to occur in patients who give an allergic history than they are in nonallergic patients. As previously noted, none of the patients in this study gave a history of previous reactions to penicillin, whereas 16.1 per cent gave histories of asthma. It is interesting that none of the latter group experienced a reaction.

Summary

Four mild cutaneous reactions occurred in a group of 385 patients receiving intramuscular injections of procaine penicillin G in aqueous suspension at the Mayo Clinic in 1952 and 1953. This incidence of 1 per cent compares favorably with an incidence of 0.75 per cent reported in 1948 after administration of the same agent sus-

(Continued on Page 680)

Tumor Conference

Section Editor
Claude Hitchcock, M.D.

Case Study, St. Barnabas Hospital

The patient (P. O.) is a young woman of thirty-one who noted a mass in the upper outer quadrant of the right breast during her sixth month of pregnancy. The patient has four children. A biopsy of the breast was performed without frozen section facilities being available, and the paraffin section histologic diagnosis was scirrhous carcinoma of the breast. The patient received a radical mastectomy immediately upon admission to St. Barnabas Hospital.

Microscopic examination of the tissue removed at surgery revealed a highly undifferentiated adenocarcinoma residual in the neighborhood of the previous biopsy, but no metastases to lymph nodes removed with the specimen. The patient's postoperative course was uneventful and advice was sought from the Tumor Conference regarding further management of the patient's problem.

The members of the Conference agreed unanimously that the pregnancy should not be interrupted. However, in view of the increased mortality from breast cancer appearing concomitantly with pregnancy, it was decided to empirically use roentgen therapy to the thoracic wall and the supraclavicular area, and to follow the birth of the child with surgical oöphorectomy.

The fact that breast cancer appearing during pregnancy carries an increased risk to the patient has been recognized for many years. However, a recent publication by Dr. Thomas White of Seattle in 1955 reviewed the world literature on this problem and presented the results of 1,413 cases. It was shown that only 2.8 per cent of all breast cancers are associated with pregnancy. For every 10,000 pregnancies we can expect to find concomitant carcinomas of the breast in three instances.

In this study the survival rates were computed according to the first, second, or third trimester and also for the period of lactation following delivery. The results are as follows: for the first trimester the five-year survival rate is 16.3 per cent, for the second trimester the five-year survival rate is 8 per cent, for the third trimester the five-year survival rate is 9.7 per cent, and for the period of lactation the five-year survival rate is 16.1 per cent. The ten-year survival rate for all of these periods varies but slightly from 5.6 per cent to 7.5 per cent. In the over-all cases reviewed the five-year survival rate was 13.8 per cent and the ten-year survival rate was 8.5 per cent. When lymph node metastases were considered, those patients without nodal metastases at the time of surgery had a 21.5 per cent chance of five-year cure and an 18 per cent chance of ten-year cure.

We have never been able to demonstrate that the emptying of the uterus, particularly in the second or third trimester, improved the chances of the pregnant female with breast cancer. Certainly there is no justification for adopting a completely pessimistic view with regard to breast cancer appearing concomitantly with pregnancy, and we must provide the best therapy possible for our patients under these circumstances. The use of oöphorectomy to prophylactically institute hormonal therapy can be questioned. However, since we know that there is an increased chance of lighting up occult metastases with subsequent pregnancies, and since there is some rationale for the removal of estrogen-producing organs of the body if occult metastases are present, oöphorectomy may well be beneficial in this case.

REACTIONS TO PENICILLIN

(Continued from Page 679)

pended in sesame oil. A brief review of the literature regarding the reported incidence of mild reactions to penicillin has been presented.

References

1. Wellman, W. E., and Herrell, W. E.: Procaine penicillin G in sesame oil: A study of reactions and results in 400 cases. Proc. Staff Meet., Mayo Clin., 23:595-600 (Dec. 8) 1948.
2. Collins-Williams, C., and Vincent, J.: Sensitivity reactions to penicillin in children. Ann. Allergy, 11:454-469 (July-Aug.) 1953.
3. Anderson, D. G., and Keefer, C. S.: The Therapeutic Value of Penicillin, a Study of 10,000 Cases. Ann Arbor, Michigan: J. W. Edwards, 1948, 297 pp.
4. Kuh, Clifford, and Collen, M. F.: Mass penicillin prophylaxis: An experiment with negative results. J.A.M.A., 140:1324-1328 (Aug. 27) 1949.
5. Kitchen, D. K.; Rein, C. R.; Thomas, E. W., and Spoor, H. J.: Reactions to penicillin. Am. J. Syph., 35:578-582 (Nov.) 1951.
6. Stollerman, G. H., and Rusoff, J. H.: Prophylaxis against group A streptococcal infections in rheumatic fever patients: Use of new repository penicillin preparation. J.A.M.A., 150:1571-1575 (Dec. 20) 1952.
7. Lepper, M. H.; Dowling, H. F.; Robinson, J. A.; Stone, T. E.; Brickhouse, R. L.; Caldwell, E. R., Jr., and Whelton, R. L.: Studies on hypersensitivity to penicillin. I. Incidence of reactions in 1,303 patients. J. Clin. Invest., 28:826-831 (Sept.) 1949.
8. Bernstein, S. H.; Feldman, H. A.; Harper, O. F., Jr., and Klingensmith, W. H.: Mass oral penicillin prophylaxis in control of streptococcal disease. Arch. Int. Med., 93:894-898 (June) 1954.
9. Simon, S. W.: Hypoallergic penicillin V (pyribenzamine-penicillin): Comparison of results and final conclusions from all studies. Ann. Allergy, 11:218-221 (Mar.-Apr.) 1953.

Editorials

JOHN F. BRIGGS, M.D.
ARTHUR H. WELLS, M.D.
HENRY G. MOEHRING, M.D.

THE PSYCHIATRIC SOCIAL WORKER IN PSYCHOSOMATIC MEDICINE

Physicians frequently refer patients having somatic symptoms with emotional involvement to the psychiatric clinic. These patients are usually having difficulty in managing their problems in daily living, although in some instances the underlying emotional distress has been obscured through the patients' concern over their physical health. In a broad sense, the goal of therapy will be to help them identify and learn to cope with the problems which interfere most with their total functioning. The methods of approach in therapy will vary greatly with the individual patient, and we feel the situations of these persons presenting psychosomatic difficulties call for flexible, imaginative use of our professional skills.

The clinical setting, where several professions collaborate in the interests of the patient, is conducive to such flexibility. Each of the several members of the psychiatric clinical team, most frequently consisting of the psychiatrist, the psychologist, and the psychiatric social worker, brings from his particular experience and training an emphasis needed for the understanding of both the personality and the situation of the patient. The need to assess the effects of the environment upon the patient is as important as the understanding of his personality. As we come to know the patients better through the professional relationship, we see their emotional conflicts of earlier origin are being reactivated with certain kinds of experiences or conditions in their current life.

Knowledge of personality dynamics is essential for all team members. The psychiatrist, as the team leader, coordinates the clinical findings of the others in the processes of diagnosis and treatment. It has often been assumed that certain patients with somatic symptoms in which emotional conflict plays a role, would require treatment directly through him. Such a plan is feasible for certain patients, but not for others. The practice of intensive psychotherapy, which would aim to reveal to the patient the nature and source of his conflict, is most often the special area of the psychiatrist. There is wide variation, however, in the capacity of individuals to utilize or profit from intensive therapy.

Frequently, these patients benefit from the approach of a psychiatric social worker who is trained in the techniques of "case work," which, in a clinic setting, is a kind of psychiatrically-socially oriented therapy. His focus is on the interaction of the patient and his environment, with which he becomes acquainted in various ways, perhaps through contact with the patient or his family, or both; or through agencies or other persons concerned with the family. The psychiatric social worker may, if working directly with the patient, help him to take certain steps to alter his situation, without engaging the patient as extensively as the psychiatrist would about the intrapsychic aspects of his problems. As in all therapy, the patient's desire for change and the development of a sound therapeutic relationship are basic in the achievement of the social work goals. Greater attention may be given to the incentives which are present or lacking in the patient's environment.

More purely psychiatrically oriented therapy aims to reach the patient on a different level; to focus more extensively with him upon his emotional reactions; to help him connect his current difficulties with his past. Needless to say, psychiatrists do not deal exclusively with the intrapsychic life of the patients; nor do psychiatric social workers restrict their attention to the influences and pressures exerted upon the patient from the outside. There are, in general, some differences in emphasis on the part of the various members of the clinical team. Our goals and methods in treatment of the individual patient have some differences, but also similarities. Each of the several professions makes a distinct contribution to clinical diagnosis.

(Mrs.) PHILIPPA H. EGGLESTON
Psychiatric Social Worker

WHAT DOES "BLUE SHIELD" MEAN TO YOU?

Have you ever stopped to ask yourself why some 37 million Americans have enrolled in Blue Shield, the medical profession's prepayment program, in a little more than ten years' time?

Blue Shield and its companion, Blue Cross, have accomplished the most stupendous enrollment any prepayment medical care program ever offered the American people—at a minimum of expense and by relatively "low pressure" sales methods. This accomplishment has been possible because there is now an almost universal desire for protection against the costs of unpredictable illness. The chief reason why so many people have chosen Blue Shield is that they know it is recommended and supported by the medical profession, and most people have confidence in the nation's doctors.

By the same token, more Americans have chosen Blue Cross than any other hospital insurance program because Blue Cross is sponsored by the hospitals, and the public believes in the integrity and efficiency of our voluntary hospital system.

Doctors and hospitals have created for themselves an immeasurable storehouse of good will in these Plans. But the preservation of this great asset depends upon eternal vigilance on the part of physicians and hospitals.

When the doctor speaks well of Blue Shield, when he renders the best service he is capable of rendering to Blue Shield patients, when he tries to conserve the resources of Blue Shield against extravagance or abuse, when he conscientiously fulfills his voluntarily accepted obligation as a participating physician, then he is helping to preserve and increase this asset. He is helping to make ever more formidable the shield that protects the freedom of medical practice.

Blue Shield is also a bridge of common interest and mutual benefit between the doctor and his patient—it is evidence to each of the trust and confidence of the other. Blue Shield is an assurance to the patient of prepaid service when he needs it—and to the doctor, it assures prompt reimbursement for his services.

Professional Relations Committee
Blue Shield Commission
Chicago, Illinois

THE TRACINGS OF ARTERIAL AND VENOUS PULSATIONS

A Forgotten Technique

The tracings of the arterial and venous pulsations of the neck (sphygmography, phlebography) were recorded a long time ago. The data gathered through their study were so valuable that good progress was made with their help in the study of arrhythmias and in that of valvular defects.

The easy handling of an electrocardiograph by a trained technician and the undeniable superiority of electrocardiography over pulse tracings for the recognition of the various types of arrhythmias gradually led to the discarding of sphygmography and phlebography as routine methods of investigation. It should be kept in mind, however, that the discarding was also due to incompetence or laziness of physicians or to the need for examining in a cursory way too many clinical cases.

In spite of the existence of many other graphic methods, the study of the carotid and jugular pulsations is still extremely valuable for the diagnosis of aortic stenosis and for that of tricuspid insufficiency. Therefore, these techniques should be used routinely by medical residents whenever diagnostic problems concerning valvular lesions are raised. It is striking to note that, even in scientific presentations, at times the data of more complex and painful procedures (arterial catheterization) are presented when a single sphygmogram would have supplied the same information.

Modern technique renders sphygmography and phlebography extremely easy. The use of a crystal microphone with a "linear" response and of an electronic type of electrocardiograph permits easy detection and correct amplification of the waves. A "suction cup" is applied over the bulb of the right external jugular vein for recording the phlebogram and is automatically held in place without compression. A small funnel is applied over the right carotid or right subclavian arteries and is held by hand with firm compression; if long tracings are desired, a special neck holder can be employed.

Simultaneous recording of sphygmograms or phlebograms and heart sounds is made in order to interpret correctly the various waves. The writer found only one slight disadvantage in the use of crystal microphones for the study of pulses: the *v-wave* of the phlebogram is at times slightly delayed and may coincide with a third sound.

In conclusion, use of correct instrumentation, theoretical knowledge of the indications and possibilities of these methods, and one hour of training should enable any interested physician to gather important data which are of frequent use in this era of cardiac surgery.

A. A. Luisada, M.D.

TV FACTS OF LIFE

The facts of life about advertising are common knowledge. Advertising boosts demand for a product to a point where increased volume lowers the unit price. Instead of adding to the price of an article, advertising actually lowers it.

Everything about advertising in general is particularly true about advertising on television. For television offers the most powerful advertising force in existence. TV shows a product, demonstrates it, and tells about it in thousands of homes simultaneously. And at a cost of a fraction of a cent per home.

With this power comes concurrently a sense of responsibility. Not every advertiser who comes to a television station is accepted. His product, the things he wants to say about it, and the way he wants to present these sales points come under the most careful inspection. Probably no other advertising media is as careful about its clients as is a reputable television station.

The reason for this careful scrutiny makes up the facts of life for the telecaster. He has a large investment in his business, and he wants to stay in public favor as long as possible. An unscrupulous promoter may figure to make a profit fast and move on. Not so the operator of the television station, who may be offered a fabulous proposition by the fly-by-night advertiser.

As in no other business, the television station owner knows his success depends upon trustworthiness, good will, and public confidence. TV is an invited guest in your home—and the TV salesman can be invited out of your living room as easily as you turn a little knob.

That's why the telecaster watches carefully over the length of a commercial message. He knows if it's too long, too insistent, or just plain irritating—"click" goes that little knob, and the audience is gone.

On the other hand, the man who's paying the bill to bring you some of the world's finest entertainment has a right to put his product before your eyes—to show you why it can make life more pleasant, your tasks easier, your home more comfortable. The challenge is in the balance, and the solution of that challenge is something of an art.

The millions of people who enjoy television daily find it hard to subscribe to the thought that TV advertising which helps people look better, smell better, feel better, and do everything from saving money to brushing teeth more regularly should be despised by every cultured American.

Gene Godt
WCCO Radio and TV

THE ETCHING PROCESS

In previous articles we have discussed the selection of copy and the making of negatives, both line negatives for zinc etchings and screen negatives for halftones. When these negatives were made, we learned that the next operation was printing them on metal, either copper or zinc.

The next step is to etch that metal to the required depth so as to have high areas, which are the printing areas, on the original surface of the plate that will carry the ink. It will have open spaces in between these high areas which do not print. It is evident that if the entire surface were a solid area or plane, we would have a resulting solid when printing. A halftone is made up of high points or dots with white areas in between. These dots vary in size—pin points in the highlight areas—a little larger size in the middle or gray tones—and a still larger dot in the solid or black portions. The metal is coated with an emulsion and these areas, we learned, which are exposed to light, become set or fixed and do not develop off the plate. Unexposed areas do and these are etched away with iron perchloride, if we are etching copper, and nitric acid, if we are etching zinc. The acid attacks these bare metal areas and etches down into the metal where there is no enamel or acid resist surface. To attain the same tone values as the original photo or copy, it is sometimes necessary to reduce the size of some of the dots. This is done by re-etching these local areas by hand. The engraver first protects the areas that had been etched to the proper tone value by painting them with an asphalt solution, then reduces the size of the dots in the remaining areas by painting on an etching solution. This he wipes off and washes out of the plates after the proper size dot has been obtained.

In etching zinc, because of large open areas between lines in many cases, it is necessary to etch into the metal deeply in these open areas so that they do not pick up ink when printing.

This is the third in a series of editorials on the subject of photo engraving.

This is done by building a bank of powder along the sides of the lines being held so that we do not etch under them, yet get depth in the areas. This is called powdering. When the proper depth and size of dots has been obtained, in the opinion of the etcher, the plate is ready for finishing and mounting. Mounting commonly means nailing or cementing the etched metal plates to a wood block which, together with the metal plate, is type high. This is done so that the face of the plate is nearly the same height as the type, for, as you know, type and etching or halftone are all locked together in a form in printing and must be of the same height so that both type and plate will receive a uniform amount of ink. Where there is a slight variation, it is possible to compensate for it in make ready by underlaying the block in selected areas with paper of the required thickness.

In mounting the plate other operations are performed, such as squaring up the plate, cutting in mortises for type and beveling. When the plate has been squared up and mounted, it is passed on to the finisher who examines it for imperfections, such as dots with imperfect shape, or closed areas between the dots, burrs on the edge of the plate and other necessary operations such as outlining, cleaning up, lettering, or burnishing down some areas to get a heavier tone.

After the finisher has completed the work to his satisfaction, the plate is ready for proofing. If the plate is a one color zinc or halftone, it is proofed on a one color press. If it is part of a more than one color job, it is desirable to proof it on a two or four color press. The proof should be run on the same paper the printed piece will be run on, for best results. The inks used in proofing should be the same as used when the work is printed and in the same sequence that will be followed when printing. If the job is to be run wet, it is advisable to proof it wet so that the press room practice is followed as closely as possible. This is the only way you can be sure the printed job will match the proofs. When the proof has been pulled or run it is examined carefully by the foreman and proofer for imperfections and when they are satisfied that it faithfully reproduces the original copy it is ready for submission. The simple outline I have given you is the procedure followed in making photo-engravings in black and white or color.

Reproducing colored art or kodachromes involves additional operations and equipment. The procedure, however, is basically the same as described for black and white. Because a résumé of this would involve more time and space than is allotted, it will be discussed at a later time.

W. W. Chreiman

THE HISTORY OF GLASS CONTAINERS

The production process in today's modern glass container plants begins with the delivery of the raw materials. All glassmaking starts with three basic ingredients: Sand (largely silica), soda ash (sodium carbonate), limestone. Cullet, which is crushed glass, is added to hasten melting and to make the batch more workable. Several other materials are used, but quantities are extremely small in relation to the three basics. However, each of these minor ingredients contributes important properties to the finished glass container.

Raw materials are weighed on automatic scales and mixed in giant hoppers. Buckets, suspended from overhead rails, carry the batch to the continuous automatic batch feeder which introduces it into the furnace or "tank" where molten glass bubbles at temperatures of more than 2700 degrees F. These white-hot infernos must be kept in operation twenty-four hours a day, seven days a week, and furnaces literally burn themselves out in about two years and must be rebuilt.

From the melting end of the tank the molten glass progresses through a submerged throat into the refining chamber, where it is purified before passing to the forming machines.

In one type of operation, the molten "metal" (as the glass blower calls it) then flows into a huge, revolving bowl made of heat-resistant material. From there it is sucked up into the hungry molds of a rapidly rotating forming machine.

In another method, the tank is mounted on a raised platform, above the forming machines, where the molten glass flows into mechanical feeders, which in turn exude red-hot gobs of a taffy consistency. Cut free, a gob of molten glass drops with the speed of a falling star into a waiting mold which presses it into a rough approximation of the finished bottle. As this mold releases the embryo, a finishing mold closes and captures it. In split seconds, compressed air blows the glass container into final shape. The mold's iron

---

This is the sixth in a series of editorials on the subject of glass and glass containers.

jaws swing open, and out comes a jar or bottle—every container uniform in size and shape.

To leave just the right temper in the glass for strength, finished containers are passed through an annealing lehr or cooling oven. In an endless parade on a moving belt, bottles and jars pass through these long, tunnel-like ovens. Heat which at first is approximately 1,000 degrees is gradually reduced to room temperature. At the end, containers are carefully inspected before packing. One minute flaw, all but invisible to the untrained eye, and the container is broken into cullet and returned to the beginning of the production line.

Some four thousand years ago, the first glass containers were priceless luxuries. Today, the literally billions of clear, amber, blue, green and opal jars and bottles used to package a long list of food products, beverages, drugs and cosmetics, and household products are necessities. Time-tested, they are the most versatile and indispensable form of packaging ever devised. Sanitary, durable and easily handled, they add nothing to or take nothing from, any product packed in them, and their contribution to the health, welfare and comfort of mankind during the last four thousand years is inestimable.

John M. Foster
Foster-Forbes Glass Company

REHABILITATION IN PULMONARY TUBERCULOSIS

Although interest in the true rehabilitation of the tuberculous in the United States goes back forty-five years to the idea of Dr. Hermann Biggs, very little has been done to implement his idea in his own country. The Altro Workshops remained almost static until after World War II, when extensions to the shops and to the trades were made. Only sputum-negative cases are admitted and the majority of the workers have had disease of only limited extent. Yet excellent results have been maintained, for not only has steady and permanent employment in first class conditions been provided in the shops, but many beneficiaries have been helped by the managing committee to work in open industry in many spheres, usually with far better economic status than they enjoyed before the discovery of their disease. No comparable sheltered workshop was established before 1939.

The Potts Memorial has unfortunately had to close down for lack of support. This is indeed a tragedy even greater than the disappearance of the village at Saranac Lake, because the latter catered in the main for those who could afford its amenities in housing, and was less interested in employment. Dr. Pattison presided at the Potts Memorial services which approximated most nearly in the United States to those of Papworth and Enham-Alamein in England. It must have been hard for him to shut down at the very time of renewed interest; it is difficult to understand why he was not supported under some section of the new measure promulgated by President Eisenhower in 1954.

In the last two years, great strides have been made throughout New York State. Under the driving force of its executive secretary, Mr. Robert Osborn, the State Aid Charities Association has established the voluntary machinery for connecting sanatorium treatment with job-placement. Education officers, occupational therapists and vocational training officers work together at hospitals, and link up with field consultants and patient services committees in the counties, towards the training and placement of patients in work properly suited to their background, their mental and manual attainments, and their functional ability. Voluntary committees are encouraged to set up sheltered workshops such as that at Binghampton. In this magnificent workshop, sputum-negative cases mix with sufferers from cardiac and orthopedic disabilities in training and in remedial exercises towards the assessment of their optimum work-potential, and can remain, on a nonresidential basis, until they are placed in local business organizations. Its committee, under the generous and understanding leadership of Mrs. Storer, is now considering housing for such beneficiaries as are unlikely to become fit for open industry. Such ventures supplement the excellent work done in state rehabilitation hospitals like that at Haverstraw, which has equipment for remedial exercises and occupational therapy that arouse envy in the British visitor.

The 1910 pronouncement of Hermann Biggs has been reiterated in modern context by Sidney H. Dressler, in a recent article in the *American Review of Tuberculosis,* in the following words: "It is medically as well as economically and

---

This is the fifth in a series of editorials on the subject of pulmonary tuberculosis.

sociologically essential to achieve complete rehabilitation as soon as possible in each patient who receives chemotherapy for pulmonary tuberculosis." He and his co-authors realize the present need in the United States. The 1954 report of the Minnesota Health and Tuberculosis Association stated that 110,000 new cases are reported each year. Some 45,000 of these join the ever growing total with resulting disability; only a very small minority can have access to services which are their due in their proper desire to re-establish themselves with self-support and self-respect. Herein lies a great opportunity for the practical application of the well-known generosity and humanitarianism of all Americans.

R. R. Trail, M.D.

THE BALLISTOCARDIOGRAM

A Question Mark

The ballistocardiogram (BCG) is a graphic representation of the motions imparted to the body by the movements of the heart, the ejection of blood, and the flow of blood through the arterial system. The movements of the body follow the Newtonian law stating that "to every action there must be an equal and opposite reaction." Therefore, impacts and recoils follow each other in the body.

Unfortunately, the vectors of force moving the body have different directions in various subjects and at every instant due to the different anatomic position of the heart within the chest, and other factors. Moreover, multiple elements connected with the structure, weight, and shape of the body, as well as with the elasticity and tonus of the vascular system change the amount of motion imparted to the body.

Most ballistocardiographs register only longitudinal (head-to-foot) motions. This motion represents only one part of the total force developed by the heart. It should be concluded that the forces which move the body in one direction are not proportional to the total of the forces causing this motion and that the degree of modification, which varies from subject to subject, is an *unknown variable.*

In spite of a large number of publications, the physiologic changes which cause or accompany the various waves of the BCG are still incompletely known, so that considerable debate is unavoidable. The confusion is increased by the fact that the waves traced by various apparatus occur at different times. Moreover, variations in vascular resistance (like those caused by drugs, reflexes, or exertion) may modify some of the waves.

The forces imparted to the body by the cardiac action cause vibrations in a range of between one and twenty cycles per second. Three different types of tracing have been recorded:

1. The *tracing of displacement* (stiff-springed Starr's bed, Dock's photoelectric method) records only the waves of lowest frequency.
2. The *tracing of velocity* (Dock's magnetic method) records mostly the waves of the zone of resonance of the body (3 to 5 cycles/min.).
3. The *tracing of acceleration* (free swinging table) records the waves in the range of 4 to 20 cycles/sec.

Recently studied devices record all three types of tracing from a single crossbar placed over the shins and connected with an electromagnetic system (Arbeit-Lindner, 1954) and it was stated that the acceleration tracing is the most reliable and clinically significant. However, the effects upon body motion of all supports and restraints produce marked alterations of the tracing, so that they are no longer true representations of the displacement, velocity, and acceleration of the body. Based on this criticism, a new device consisting of a lightweight, swinging bed and a magnetic arrangement recording the three types of BCG was described (Rappaport, 1955). Unfortunately, the new tracings are quite dissimilar from any of those previously described and the acceleration tracing resembles a low frequency tracing of the precordium.

Pending further studies, it is advisable to maintain an expectant attitude and to abstain from drawing precise clinical conclusions based on the BCG tracing.

In regard to the ballistocardiogram, one is still tempted to repeat a well-known phrase: "It is a mystery wrapped up in a puzzle inside an enigma."!

A. A. Luisada, M.D.

CHEST SHADOWS IN THE AGING

Serious chest conditions particularly prevalent among older persons, such as primary malignancies and tuberculosis, usually pass through a silent stage of evolution when their presence can be detected only by their x-ray shadows. For this reason, chest shadows in the aging are particularly important, writes Dr. J. Arthur Myers, professor of medicine and chief of the Chest Clinic, University of Minnesota Medical School. Specific diagnoses cannot be made from x-ray shadows of lesions, but the shadows indicate the presence of disease, after which the etiology usually can be determined promptly by other phases of an examination.—J. A. Myers, *Geriatrics*

President's Letter

DEPENDENT MEDICAL CARE

The new Military Dependents' Medical Care Act which was passed by Congress on June 5, sets up the financial machinery for furnishing private medical care to hundreds of thousands of wives and children of servicemen.

For the first time there will be medical care available at government expense for individuals who are not necessarily veterans themselves nor in low income brackets. The act provides medical care for spouses and children of all military personnel. This care may be given by civilian physicians in civilian hospitals when military facilities are not readily available or are filled to optimum capacity.

The law goes into effect December 8 and medical associations were requested to make all arrangements for local administration by October 8 to give the Department time to implement the law.

The Act was discussed at a summer meeting of various committees of the American Medical Association. The importance of an early decision on methods for handling the matter on the state level became obvious, so in August a special meeting of our Council was held as well as a special meeting of the North Central Medical Conference for the purpose of co-ordinating actions taken by the conference states (Minnesota, Wisconsin, North Dakota, South Dakota, Iowa and Nebraska).

At our Council meeting, it was decided that the Minnesota State Medical Association should act as the contracting and fiscal agency for this dependent medical care program in Minnesota and that the program would be handled here in the same manner as the veterans' home town medical care program. Headquarters for the program would be in the state office. It was also decided at the same meeting that the various specialty groups concerned should be asked to determine the average fees to be set in Minnesota for the medical procedures within their specialties.

The Department of Defense sent out the official nomenclature of fees in August. This included approximately 1,400 items which are to be priced at prevailing average rates in the community.

Dependents of military personnel stationed in Minnesota who will be eligible for care under this program number 5,976.

The number of dependents of draftees and other personnel now stationed *outside* of Minnesota is unknown and Selective Service officials say they are unable to make any estimate of the figure.

The program is limited to medical care while the dependents are in the hospital but there are broad exceptions permitting diagnostic services and after care in the physician's office; also office care for injuries.

The patient will pay the first $25 of hospital expenses or $1.75 a day, whichever is greater, for a period up to 365 days for each hospital admission. The patient will pay nothing for medical services but the government will pay civilian physicians average fees prevailing in their communities as mentioned earlier. No prior authorizations are required and the fees are to be independent of either Blue Shield or welfare schedules.

R. H. Wilson

President, Minnesota State Medical Association

Committee Action

Tuberculosis

Tuberculosis Sanatoria
Realistic Approach
Private Physician's Care
Elimination of Sanatoria?
Solution of Problem—Five or One Hundred Years?

The meeting of June 22, 1956, was called to order by Chairman John F. Briggs, who asked for general discussion of the problem of what to do with empty sanatorium beds.

Dr. Slater emphasized the fact that, while the new drugs are wonderful aids to treatment, none of them has yet been able to cure tuberculosis. Many patients who have been discharged as cured are coming back. He recommended that the committee take a stand that every person having an open case of tuberculosis should be in the sanatorium. The sanatorium has done a wonderful job both for the patients and for the protection of their families and communities.

Dr. Cohen said the pace of hospital treatment is different but the number of patients entering the sanatorium is the same as before. He noted, also, that prior to the era of chemotherapy there was a constant population of "good chronics," at Glen Lake. These patients never died, never got well. Now, as of three months ago, there are thirty to thirty-five patients in that category. The others have become negative, and different arrangements could be made. A report on unused beds has been made by the Trudeau Society, Dr. Cohen said, and he hopes to get mimeographed copies for the committee. Plans should be drawn up, he believes, on a logical, co-ordinated basis.

Dr. Fleming pointed to the fact that there are many cases that are missed because of inadequate follow-up and lack of public health nurses. More beds would be needed if these cases could be discovered.

Dr. Callahan agreed with Dr. Slater that every person with positive tuberculosis should be admitted to the sanatorium, but he said the situation is very different today from what it was twenty-five years ago, and drugs have had a great influence in controlling infection. Bacteriostatic qualities of the drugs have kept germs from multiplying and have removed one of the nightmares of years ago. "We have all had the experience" he said, "of having women patients apparently cured until they became pregnant. Often they would be running temperatures and would require hospitalization within two months, sometimes going on to chronic invalidism or death. With chemotherapy, the mother continues healthy and the children in most cases show no reaction to tuberculin.

It was pointed out in the discussion that the modern sanatorium is really a hospital, capable of giving full hospital care for anything that may develop. Hundreds of persons are being saved from relapses as a result of chemotherapy, and use of the drugs permits surgery that could not have been considered before. It is most impressive that patients who have had full treatment, including surgery if indicated, do not relapse as before.

Members of the committee stated that they had been impressed by the work now being done at the State Sanatorium. Although no resection surgery is done, there is an active staff and laboratory, and treatment is being carefully checked to measure effectiveness. There are three standard drugs, and the Veterans Administration has done effective work in determining how best to use them. A combination of all three, PAS, Streptomycin and Isoniazid, seems to be most effective while the patient is in the sanatorium. A different program should be followed when the patient goes home to avoid the necessity for seeing a doctor oftener than every three or four days.

The reason for the empty beds is that the patients have had surgery and drug treatment so that recurrences are cut down and there are few repeaters. Actually, since the advent of chemotherapy, the reduction in death rates and the empty beds have gone hand in hand. Individualized use of drugs in combinations have been found best to avoid development of drug-resistant bacteria, and gastric and sputum cutlures are essential to check on therapy. In the Anoka group, for example, frequent cultures were not possible earlier and patients otherwise suitable for surgery have been found, after operation, to be resistant to drugs, with poor results as a consequence. It is now possible to make use of facilities at Glen Lake and the Health Department. Laboratory studies should be carried out every three months together with proper changes in drugs, for best results.

Dr. Backus said he and his staff at Nopeming are deeply concerned with the problem of empty beds. He agreed that every person having active tuberculosis should be in the sanatorium and that changes in the handling of treatment have stepped up the tempo of bed occupancy. Reactivation has been sharply reduced and at Nopeming the number of reactivations, once one in three, has now been reduced to a small percentage. In spite of the fact that about as many new cases are being found, due to an active case-finding program, the situation has changed markedly. In 1948, there were 330 cases from St. Louis County at Nopeming. Now there are 140 cases in the sanatorium, about one-quarter of them from St. Louis County. "That means we are going to have to reduce our staff and our laboratory," Dr. Backus said, "and our treatment is going to be less effective. The situation can be viewed from two points of view. From the dollar point of view, it is good. From the point of view of the patient who has tuberculosis, it is not good because we shall not be able to give him the care he should have. Of course, the county may want to use the beds for other purposes. The question is: For what purposes? We would certainly like to know."

Dr. Barr predicted that within ten years there might be no tuberculosis sanatoriums at all in Minnesota. Patients would be handled in general hospitals just as other patients are handled, except that they might be in the hospital a somewhat longer time. There they would have the staff, laboratory and x-ray services needed for proper care. He said that in 1936 there were 4,500 beds for tuberculosis in Minnesota, which number represented a high relationship of beds to death rate in comparison with other states in the country. "We now have 1,656 beds in the state," he said, "and every sanatorium has large vacancies. At the same time, there is a terrific demand for beds for the care of older people. If some of the county sanatoriums were closed, it was thought last January that the State Sanatorium could be kept full. Real concern was expressed in the discussions at that time about the continuance of case-finding programs carried on by the county sanatoriums. The concern was certainly laudable and we know that more case-finding has been done by the county sanatoriums than by any other agencies. On the other hand, some of our recent studies have revealed other answers to that problem, too. For instance, the routine hospital admission x-ray is a fruitful means of unsuspected case-finding, and only a few hospitals in some areas have established that program. Also, only three counties in the Crookston area, for example, have county public health nurses. But county nurses are the best agencies for follow-up and they can help greatly to take the place of the sanatoriums in case-finding. We need to screen certain population groups, such as the Gateway district in Minneapolis. But most cases are found through the routine hospital admission x-ray program.

"In any case, I think we should be honest about the situation," he said. "Sanatorium beds actually represent a small part of the answer to tuberculosis control. They represent only a stop-gap. The need today is to build sanatoriums in connection with general hospitals and not by themselves on the outskirts of towns. Not only Nopeming but Glen Lake and the State Sanatorium have serious vacancies, and it is not realistic to try to concentrate tuberculosis patients in these institutions. We are going to be obliged to use these institutions for other types of patients. When Dr. Slater leaves Southwestern Sanatorium, the sanatorium will be dead. No doctor can be found who will take his place."

Dr. Hodgson made the comment that he, personally, approves empty beds. "We might as well face the inevitable," he said. "There is no use in keeping beds that are not needed. We must face the fact that the private physician is taking care of tuberculosis patients and we should welcome the change. But where one doctor is qualified for the task, another may need education. We must educate all our doctors about the hazards involved in modern methods of treatment, and this committee is a good place to start." He said he would like to see a sign on every closed sanatorium that would read "This institution closed because the doctors who managed it were interested in the control of tuberculosis."

Dr. Jordan reported that he and Dr. Kathleen Jordan have just finished testing 16,000 children in the area of Riverside Sanatorium at Granite Falls. For years, he said, they had found no positive reactors in the first, second or third grades. But this year, there were a number of reactors among those age groups. They were children of World War II and of Korean war veterans. "Tuberculosis is not licked, and it won't be licked for years to come," he said. "And as for leaving case-finding to county nurses, I am skeptical of results. In our area, county nurses have too many reports to fill out to have adequate time for follow-up. The county nurse in our county has not yet got around to visiting a woman found in November. We are trying now to get every patient tested who goes to a doctor's office, as a matter of office routine. The average age of patients in the sanatorium was once forty years but it is now sixty-eight years, and we are practically an old folks' home. We find patients who have had various types of chemotherapy given mostly by young doctors for 'virus disease or pulmonary disease' who have never been tested. We need routine testing by doctors as well as routine hospital x-rays," he said.

Dr. Meyers recalled the history of tuberculosis control from the time of Koch. "Each time an important advance was made," he recalled, "people said 'It's all over.' Koch said it; Von Behring said it; Marfan said it. But tuberculosis is the most deceitful disease that ever attacked human beings, and it was not all over. The trouble was they did not watch long enough. Now we are in a like situation. We are drawing conclusions prematurely. Not enough time has elapsed to be certain, yet, that we have conquered tuberculosis. The other day, Lon Williams said he doubted if any of our present drugs would be used in ten years. We can't know for twenty years whether the drugs we are using now are effective for more than a year or two. We don't know, yet, whether they kill tubercle bacillae or not. I remember when we were begging for sanatoriums to cure tuberculosis. People said, 'give us the sanatoriums and we will solve the tuberculosis problem in twenty years.' Now the Interim Commission has said the problem will be solved within five years and the rate will be no more than 5/100,000. Others say the answer lies in drugs plus surgery, and there will be no problems in ten years.

"In this state, we know that 10 per cent of the people are harboring tubercle bacillae in their bodies, and some of them are going to break down. I venture to say that nobody alive today will actually see the tuberculosis problem solved. I believe we are making the greatest mistake since 1872. In 1952, I said there would be only three sanatoriums left in ten years and only one left in twenty years. Now we see ten times more displaced persons developing tuberculosis than native Americans, and we have many illegal immigrants from countries where tuberculosis is prevalent. These people do not report for treatment until they break down. On the University campus, 60 per cent of breakdowns are among foreign students. Yet these students constitute only 3 per cent of the student population. We should look at the Veterans Administration census, also.

"When the report of what we have said tonight is read twenty-five years from now, I do not want to be on the record as having said: 'Let's stop—we have conquered tuberculosis.'

"As to the sanatoriums—we do have vacant beds, it is true. And it is also true that many people are being treated by private doctors who should be in the sanatorium. Many European doctors tell us that most of their patients who enter the sanatorium are people who were thought to be cured. I believe we should hold our beds which were provided through the tremendous effort of people like Dr. Longstreet Taylor. We did get the beds, and now we are talking of abandoning them. Many of the people who are now being treated with drugs are going to break down. They will need institutional care. But if we abandon our beds, we shall not get them back again. We may set them aside for care of elderly people, now, but we should hold them for the time when the disease comes back again."

Dr. Slater said he had always opposed socialized medicine even though he worked in a state institution. He has always felt that the practicing physician is the cornerstone of tuberculosis control and he must be kept interested and informed. He said he wanted to emphasize what he had said before, that every person with an open case of tuberculosis should be in an institution. There is still a job to do in both respects.

Dr. Callahan remarked that it seemed to him unfair to invite foreigners into the country and then drop them into the laps of local counties and states which they break down with tuberculosis. He said he is heartily in favor of Dr. Slater's idea that the men in general practice should have more training and education in handling tuberculosis. He said he realized that the problem will not be solved for 100 years. At the same time he does not favor keeping sanatorium beds empty when they could be put to useful purposes. There are many tax problems in the state. The Legislature is seriously questioning the expense of caring for recipients of Old Age Assistance and of Aid to Dependent Children, and it is his hope the care of the sick patient can be kept in the hands of the medical profession without arbitrary limits as to expenditures. Use of empty beds can help solve the tax problem.

Dr. Briggs said the meeting had been planned as the start of a pilot study, only. All would agree that

(Continued on Page 693)

Medical Economics

Edited by the
Committee on Medical Economics,
Minnesota State Medical Association
George Earl, M.D., Chairman

LEGISLATIVE REVIEW OF THE 84th CONGRESS

During the two years of the 84th Congress, the Washington office of the American Medical Association analyzed and followed closely a total of 571 bills in the health fields. Twenty-five of these became law.

Once the 85th Congress convenes next January, health bills that died in committees this year are likely to be reintroduced along with many new ones. In any event bills are certain to include federal aid to medical education, federal workers' health insurance, pooling arrangements among small health insurance companies, federal aid to local public health units, mortgage loan guarantees to private medical facilities and controls over barbiturates and amphetamines.

Bills which actually became law during the past two years include:

Military Legislation

Dependent Medical Care.—(for details on how this program is to be carried out in Minnesota, please see this month's President's Letter.)

Career Incentive Pay.—Public Law 497 is directed at another Defense Department problem: how to attract and retain physicians in the Army, Navy and Air Force. To help in this program, the 84th Congress approved the career incentives bill which does the following: (1) gives all doctors in uniform including the commissioned corps of Public Health Service, an extra $50 a month after more than two years' service, $100 extra after six years and $150 a month after ten years, and (2) credits medical school and internship training periods toward future pay and promotions. These payments are in addition to the present extra $100 per month equalization pay.

Doctor Draft Extension.—One of the early health measures to pass in the first session of this Congress, P. L. 118, extended the Doctor Draft Act until July 1, 1957, Congress agreeing it was essential in order to procure enough experienced physicians to maintain high medical care standards. The law also extends for four years to July, 1959, the $100-a-month equalization pay for doctors.

Military Status for PHS.—Public Law 492 permits the President, in time of national emergency, to give the commissioned corps of Public Health Service military status.

Commissioning of Osteopaths.—Under Public Law 763, osteopaths are eligible (on a permissive basis) for the first time for medical commissions in all the military services.

Public Health Legislation

Health Amendments (Omnibus) Act.—Popularly known as the little omnibus health bill, this measure (P. L. 911) represents a compromise between what the administration sought in its omnibus proposal of more than a year ago and what the majority in Congress wanted. Its five titles provide the following: (1) extension for two years beyond next July 1 of the Hill-Burton hospital construction program, (2) grants to states, groups and individuals for research in mental health, (3) traineeship grants for public health personnel, (4) traineeships for graduate nurses, and (5) earmarked funds for practical nurse training. The original Eisenhower omnibus health bill included the twice-rejected health reinsurance fund and mortgage loan guarantees for health facilities.

National Health Survey.—To fill what its sponsors describe as a twenty-year gap in knowledge, Public Law 652 provides for special and continuing surveys of the amount, distribution and effects of illness and disability and the types of medical services furnished.

Salk Vaccine Grants.—In the first session, Congress voted $30 million for grants to the states to help finance inoculations of persons who otherwise might not receive Salk vaccine. It stipulated that the money would be available until February 15, 1956 (Public Law 377). One of the early actions of the second session was a seventeen-month extension (to July 1, 1957) of the program (Public Law 411).

Alaskan Mental Health.—This proposal to modernize the Territory's mental health program, including construction of facilities, was passed in the House with little debate early in the second session. Then opposition developed over commitment procedures. Finally, it passed with a proviso that the territorial legislature decide on commitment procedures (Public Law 830).

Water Pollution Control.—Congress in its second session voted to make the expiring Water Pollution Control Act permanent and to authorize $50 million a year for ten years in grants to states and communities to build sewage disposal plants. The administration favored loans rather than grants. It became Public Law 660.

Air Pollution Control.—One of the few health measures to pass in the first session, Public Law 159 authorized $25 million over five years for grants to states, private groups and individuals for research, training and demonstrations in air pollution.

Mental Health Survey.—Another first session measure was Public Law 182 which authorized $1,250,000 to finance a broad three-year survey of mental health problems and existing programs. The Joint Commission of Mental Illness and Health, aided by additional grants from private sources, is now making the study.

General Medical Legislation

Laboratory Research Construction.—Public Law 835, which authorizes a three-year program of $90 million in grants to medical schools, hospitals and other non-federal institutions for laboratory facilities doing health and medical research, was one of the major measures enacted by the 84th Congress. It passed the Senate in the final days of the first session but was held up for months this year in the House while bill managers pondered the addition of federal construction grants for medical schools. The medical school aid feature was dropped in favor of further study.

National Library of Medicine.—Another milestone this session was the measure reconstituting the Armed Forces Medical Library as the National Library of Medicine and placing it for administrative purposes in the Department of Health, Education, and Welfare. When a group of Congressmen pressed for location of the library in Chicago instead of the Washington (D. C.) area, it appeared the proposal would be stymied in committee. In a compromise, Congress voted to have the seventeen-man board of regents select a site. Public Law 941 was the result.

Narcotics Control.—This measure stiffens penalties for peddlers and smugglers of narcotics and heroin. The death penalty is permissive under the act (P. L. 728) for peddling heroin to minors. Considered, but not passed, by this Congress was a bill calling for tighter controls over barbiturates and amphetamines.

Social Welfare Legislation

Social Security Amendments.—One of the most controversial measures to come before Congress in years was the Social Security bill (now P. L. 880) passed on the very last day of the second session. It includes cash payments for disability at age fifty, a proposal that slipped through the House in 1955 without public hearings and limited debate and came within one vote of being defeated in the Senate this year. Other provisions: (1) a so-called separate fund for LASI payments to workers found totally and permanently disabled at age fifty, (2) an additional ½ per cent payroll tax effective next January 1 (half to be paid by employe, half by employer) and ⅜ per cent tax for the self-employed, (3) inclusion of dentists, osteopaths, lawyers and other groups in the social security system, (4) lowering retirement age for women to sixty-two, (5) increased federal payments to the states for persons on public assistance rolls, and (6) ear-marked payments to states for the medical care of public assistance recipients.

Other Legislation

Foreign Service Dependents Medical Care.—Some 13,500 dependents of Foreign Service employes living abroad are eligible under Public Law 828 for full hospital and medical care expenses up to 120 days, with the first $35 paid by the dependent. The law also provides for federal payment of health insurance written for employes or dependents and for transportation to the nearest hospital or clinic.

World Health Assembly.—In observance of the tenth anniversary of the founding of the World Health Organization, the United States will invite the World Health Assembly to meet in this country in 1958. This is made possible through enactment of Public Law 832, authorizing $400,000 to finance additional costs of the meeting.

Donable Property.—Surplus Federal property is made available under Public Law 655 to public and non-profit institutions and agencies for civil defense work.

Study Committees on Education.—Public Law 813 authorizes funds for the President's Committee on Education beyond the High School and for similar state committees.

Tax Deferments for Research.—On top of the standard 20 per cent deduction for charitable contributions, Public Law 1022 permits another 10 per cent of adjusted gross income for certain qualified medical research organizations. *Also* P. L. 398, raising the earning limits without forfeiture of social security payments; P. L. 937, extending for another year grants to states for initiating and improving vocational rehabilitation programs; and P. L. 294, for appointment of male nurses as Reserve officers.

LIMIT RAISED ON CHARITABLE CONTRIBUTIONS TO MEDICAL RESEARCH GROUPS

Congress approved an amendment to the Internal Revenue Code to raise the charitable contribution limit for individuals from 20 to 30 per cent of adjusted gross income in the case of certain contributions to medical research organizations in the same manner as the limit for contributions to hospitals, educational institutions and churches.

The contributions to medical research organizations that will qualify under this legislation are only those made to organizations directly engaged in the continuous active conduct of medical research in conjunction with a hospital and only if such an organization is committed to spend such contributions for such research before January 1, of the fifth calendar year beginning after the date of the contributions.

MEDICAL SCHOOLS IN UNITED STATES SHOW VAST EXPANSION

With a record enrollment and projected operating budgets hitting the $111 million-mark, the nation's medical schools recently reported that 1955-56 was a year of "continuing progress."

For the seventh consecutive year, enrollment reached an all-time high with 28,639 students in seventy-six approved four-year schools and six schools which provide the first two years of medical training. The 1955 entering class was also the largest ever, with 7,686 students beginning their studies.

Sixteen American schools and one Canadian school reported the completion of construction projects costing more than $65 million.

RECENT SURVEYS REVEAL STATISTICS OF INTEREST TO PHYSICIANS

Health Insurance Coverage at All-Time High

Benefit payments designed to help individuals pay hospital and doctor bills are running 20 per cent higher this year than last, the Health Insurance Council announced recently. As of July 31, the Council estimated that some 110 million persons were covered by hospital insurance; 94 million had surgical protection; 58 million had regular medical expense coverage and seven million were insured against major hospital and medical expenses.

Physical Examinations of Physicians

During the annual AMA meeting in Chicago, physicians had an opportunity for physical examinations. The project was a joint enterprise of the AMA Section on General Practice, the American Academy of General Practice and the National Tuberculosis Association. A study of the results shows that 6 per cent of the total examined had suspected tuberculosis; cardiac findings were noted in 4.3 per cent of the x-rays: 10 per cent of the electrocardiograms were abnormal and 5.1 per cent were borderline.

Bureau Claims Medical Costs Rising

Medical costs have been rising faster than any other item on the cost-of-living index, according to the Bureau of Labor Statistics. A patient must now pay 25 per cent more for treatment than in 1950, as compared to an 8 per cent rise in the overall price index, states the report.

Study of 1956 Medical Association Dues

The Michigan State Medical Society recently surveyed each of the forty-nine constituent state medical associations (including the District of Columbia) on current state dues. The study shows that the average American physician pays between $50 and $60 per year state association dues. His county society dues range from $20 to $70 per year, depending upon whether the county or component society maintains an executive office. Detailed information on this study may be obtained from William J. Burns, executive director of the Michigan State Medical Society.

COMMITTEE ACTION—Tuberculosis

(Continued from Page 689)

tuberculosis is far from conquered, but there are empty beds and some plan must be made for using them. The problem is what plan should be made.

Dr. Cohen added that tuberculosis is, in fact, a generation disease. The effects of modern treatment will be felt in the next generation, and we are now reaping results of treatment of a generation ago. Under the present system of case-finding and treatment, tuberculosis seems to be better controlled than formerly. But the same conditions must continue to operate if the improvement is to continue.

Dr. Myers said he felt the sanatoriums should be continued as institutions for the treatment of tuberculosis, but empty beds should be converted to other uses.

Dr. Callahan added that once a patient has been in an institution he should be on follow-up for the rest of his life.

Dr. Hodgson re-emphasized the fact that there never was a time when the general practitioner was as important as now in the control of disease.

Dr. Briggs then appointed Dr. Cohen as chairman with Drs. Myers, Bridge, Fleming, Barr, Mark and James Rogers Fox on a study committee to draw up plans for use of empty sanatorium beds.

The importance of the general practitioner in the program of the future was further discussed, and Dr. Briggs appointed Dr. Sheppard to head a committee for the purpose of interesting physicians in case-finding, including routine Mantoux testing in the doctor's office. He suggested the possibility, also, of enlisting the interest of the Academy of General Practitioners in the committee's work.

The meeting adjourned.

John F. Briggs, M.D., St. Paul, *Chairman*
J. A. Myers, M.D., Minneapolis
R. N. Barr, M.D., Minneapolis
F. F. Callahan, M.D., St. Paul
S. S. Cohen, M.D., Oak Terrace
Dean S. Fleming, M.D., Hopkins
Corrin H. Hodgson, M.D., Rochester
L. S. Jordan, M.D., Granite Falls
C. G. Sheppard, M.D., Hutchinson
S. A. Slater, M.D., Worthington
R. W. Backus, M.D., Nopeming
James Bellomo, M.D., St. Paul
Thomas Mulrooney, St. Paul
MTHA representative
Nopeming Sanatorium staff representative

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

230 Lowry Medical Arts Building
Saint Paul, Minnesota

F. H. Magney, M.D., Secretary

LICENSE OF SANDSTONE PHYSICIAN REVOKED

Re: The Revocation of the License of
Frank A. Rudolph, M.D.

The Minnesota State Board of Medical Examiners on July 7, 1955, revoked the medical license held by Dr. Frank A. Rudolph, Sandstone, Minnesota. A citation for the revocation of Dr. Rudolph's license which had been issued by the Board on April 17, 1956, charged him with using indecent and obscene language in speaking to a woman patient and with making improper and indecent advances to her. Dr. Rudolph denied the charge, and a hearing was held before the Board on May 11, 1956. After hearing a number of witnesses, both in support of the citation and in Dr. Rudolph's behalf, the Board took the matter under advisement until the meeting of the Board on July 7, when Dr. Rudolph was found guilty of the charges against him.

Dr. Rudolph was born in Great Falls, Montana, on October 5, 1910. He graduated from the University of Montana State Normal College at Dillon, Montana, in 1933. According to Dr. Rudolph's testimony before the Board, he was then a teacher and coach in Boseman, Montana, for six years. Dr. Rudolph attended several summer sessions at the University of Minnesota and then enrolled in the University of South Dakota Medical School in 1939 where he received a B.S. degree of medicine in 1941. After entering the University of Vermont College of Medicine in the fall of 1941, Dr. Rudolph was granted the degree of doctor of medicine in March, 1943. Upon the completion of his internship at Swedish Hospital in Minneapolis, Dr. Rudolph was in the armed services until September, 1946.

In 1947, Dr. Rudolph began the practice of medicine at Rapid City, South Dakota, where he practiced almost four years when he left to take postgraduate training in Ohio. Dr. Rudolph returned to the practice of medicine at Rapid City in December, 1953, but remained there for only a period of approximately six months when he went to Sandstone, Minnesota, to engage in the practice of medicine. Dr. Rudolph was licensed to practice medicine in Minnesota in November, 1946. He is also licensed in Vermont, South Dakota, and Ohio.

Help Detect Occult Cancer

Doctor:

You will receive during November *a booklet* explaining the Cancer Detection Program sponsored by your State Cancer Committee. Please save this manual for use in your office.

Here is an opportunity to help increase survivors from cancer in our State through widespread detection of *pre-symptomatic cancers.* Your State Medical Association endorses this Program as a significant effort toward reduction of cancer deaths.

Join with us in a Minnesota Cancer Crusade. Help our State lead the nation in the fight against cancer.

Cancer Committee,
Minnesota State Medical Association

History of Medicine in Minnesota

THE MEDICAL HISTORY OF RICE COUNTY

(1855-1901)

ADOLPH M. HANSON, M.D.
Faribault, Minnesota

(Conclusion)

Sperry, Lyman Beecher.—Dr. Sperry was born June 8, 1840, and died suddenly at Flathead Lake, Montana, July 1, 1923.

After graduation from the University of Michigan at Ann Arbor in 1863 he practiced a year at a village near his birthplace, but he could not stand pounding the rough roads with horses and buggy. So he went to Ripon College as a professor.

In his short practice he had an interesting patient in Horace Greeley's sister and Horace himself handed him his personal check for $50 in payment of his fee.

While at Ripon he accepted the appointment as Indian Agent at Fort Berthold, Dacotah Territory from President Grant in an effort to clean up the corruption in the Indian service. The crusade was under the sponsorship of the American Missionary Faculty and others. Gen. Geo. A. Custer was military commander in that area and was ordered to help when he could. Dr. Sperry took the Chiefs to see the President at Washington and to inspect Indian Territory when the government wanted them to migrate, but when they looked it over they refused to move. He there had the chance to study the American Indian. After finishing the job, he went on the Carleton College faculty.

While at Carleton College he obtained a French manikin of the human body, which he used in class work on a trek to many neighboring lawns to illustrate his health and hygiene lectures. He invited parents of teenagers to the College, and he would take the manikin apart for their information. Many can recall those trips and the genial doctor who took the body apart.

He became interested in the YMCA movement as a useful non-denominational agency for boys and men, and for many years devoted his efforts to giving a week-long series of lectures on health and sex hygiene, ending with a travelogue, all illustrated with colored slides. In summer he traveled both at home and abroad seeking new material, conducting tours to the National Parks. His trips to and work in Glacier Park helped a great deal in having it set aside by the government as a National Park in 1909, which was twenty years after he first went into it.

He had a fine descriptive power and a keen sense of humor and drew large audiences whenever he spoke.

He was the arch-enemy of quacks and quackery, and many a young man he kept out of their clutches. He always clung to the strictly scientific line in his efforts to help others to understand life.

He continued his efforts until he was in his seventies. He then bought a home in Los Angeles, California, and lived there comfortably the rest of his life and enjoyed good health.

The key to his life was the fact that when he was a teen-aged boy he saw a slave auction in New Orleans, La., where a young mixed-blood, who was nearly white, was stripped to the skin and sold to a young man for a few hundred dollars. That made him want to help others, and he did.

(The above short biography is taken *verbatim* from a personal letter written to the writer by Lyman Beecher Sperry's nephew, Albert Lewis Sperry, the author of *Avalanche,* dated November 25, 1953).

Sperry Glacier in Glacier Park is named after Lyman Beecher Sperry. He was the author of several books on hygiene and physiology.

Stevens, W. H.—Practiced in Faribault before 1900, but nothing else can be ascertained about him. He was not licensed in Minnesota.

Stinchfield, Augustus White (1842-1917).—Practiced in Dundas from 1872 into 1873. He had graduated from the Medical College of Maine, of Bowdoin College, in 1868 and first practiced at Verona, Lawrence County, Missouri, from 1869 to 1872. In the fall of 1873 he moved to Eyota, Olmsted County, where he remained until February, 1892, when he accepted the invitation of the Mayos to join them as a partner. He retired from this partnership in 1906 and died in Rochester March 15, 1917. An excellent biographical sketch was published "Medicine and its Practitioners in Olmsted County Prior to 1900" by Nora H. Guthrey (MINNESOTA MEDICINE, 1949-1951).

Thompson, Charles M.—Dr. Thompson was born in Scotland on July 7, 1844. He emigrated with his parents to America when ten years of age. His parents first settled in Worcester, Massachusetts, being Scotch weavers from Edinburgh. In a short time, they moved to Waterville, Maine. Young Thompson, who had "weak lungs," came to Stillwater, Minnesota, when fifteen years of age (1859). A year later he went south for his health. He came to Northfield in 1865 when he was twenty-one years old, and it was after the end of the Civil War. Had he served in the Confederate Army? (His record is silent as to that). At Northfield, he clerked in a store for two years, "studying medicine at the same time" (probably with some local physician). In 1867, he went to Ann Arbor, Michigan, and graduated from the Medical School of the University of Michigan in the spring of 1870. He returned to Northfield immediately following his graduation and established his practice there.

During the course of the next ten years he devoted one year to earnest postgraduate studies at the University of Edinburgh and at famous Old St. Bartholomew's Hospital in London. He was married to Mrs. Annie M. Smith, a widow, on August 30, 1881, at his then age of thirty-seven. He was still practicing in Northfield at the time the *History of Rice County* was published in 1882. This story of young Thompson, the delicate son of Scotch weavers, who returned to Edinburgh, the city of his childhood, as the young American M.D. to take postgraduate work (probably to earn his F.R.C.S., Edin.) intrigues the writer: the poor and sickly lad, who returned to realize his boyhood's and life's ambition to write "M.D., F.R.C.S. (Edin.)" after his name, to have it on his letterhead and at the top of his Rx blanks.

Tucker, Genevieve.—She graduated from the Homeopathic Medical College of the University of Michigan at Ann Arbor in 1880. She started to practice in Northfield in 1883 or before and was still there in 1890. She was Secretary of the Minnesota State Homeopathic Institution. Dr. Tucker was licensed in Minnesota on October 11, 1883. Between 1895 and 1905 she was in Pueblo, Colorado, around 1909 in Davenport, Iowa. In the 1920's she was located in Washington, D. C. She apparently retired from practice in the early 1930's and lived in Atlantic Highlands, New Jersey.

Turner, Granville R.—He had the distinction of being the first homeopathic physician to come to Faribault (1854 or 1855). He was half-owner of Turner's & George W. Batchelder's Addition to Faribault, platted in the year 1857. He was a real estate man with medicine as a sideline. He departed Faribault in 1857 and resided somewhere in Wisconsin at the time of his death years later (no other record is available).

Wagner, Charles H.—Established his practice in Faribault before 1890. He was born in Wyocena, Wisconsin, February 12, 1853. He supposedly graduated from the Homeopathic Hospital College, Cleveland, in 1873, and was licensed in Minnesota in 1883. In 1896 he turned his practice over to Dr. Walter Henry Robilliard and moved to Minneapolis. He retired from medical practice long before he died on March 1, 1920, at the age of sixty-seven. Dr. Wagner was vice-president and director of the Northwestern States Portland Cement Company, Mason City, Iowa; the Trinity Portland Cement Company, Dallas, Texas, and the Northwestern Metal Ware Company, Minneapolis.

Ward, W. Tilliard (Tilleard).—A graduate of the Medical Department of McGill University in Montreal in 1873, he is known to have practiced in Morristown during the years 1886-1893. He was licensed in Minnesota by exemption.

Warren, F. S.—Dr. Warren was born in St. Paul, Minnesota, on May 9, 1874. Following his graduation from the Medical School of the University of Minnesota, he took his internship at the City and County Hospital (now Ancker Hospital), St. Paul, Minnesota. He started practice in Faribault, Minnesota, in 1897. He did postgraduate work at the New York Post-Graduate Hospital. After enjoying a big and successful practice for thirty-three years, he retired in October of 1930 and moved to Washington, D. C., where he died on January 20, 1945, at the age of seventy-one. During the course of the years following his retirement, Dr. Warren never lost his interest in medicine. He visited the big hospitals in the East, particularly, the New York Post-Graduate Hospital. He returned on several occasions to renew old acquaintances at Faribault and to entertain his professional brothers at an inn south of Faribault.

Williams, A. D.—Physician and Baptist clergyman, came to Minnesota in 1866 and engaged in home missionary work in Faribault. He was born in Bennington, Vermont, in 1826, graduated from the Rochester University in 1855 and the Rochester Theological Seminary in 1857. It is probable that he practiced medicine as part of his missionary work in Rice County. After 1870 he was in Brooklyn, Hennepin County, where he was pastor for two years and later practiced medicine.

Wilson, Henry L.—According to the *New Federal Union* of Rochester, Minnesota, he established himself at Dundas, where he purchased a first-class pharmacy on March 9, 1867.

Wilson, Warren.—The writer cannot do better than to quote his son, Dr. Warren Wilson, Jr., of Northfield, Minnesota:

Dr. Warren Wilson was born in Ontario, Canada, in 1863. At the early age of three, one of his elders asked him what he was going to be when he grew up, and he replied: "A doctor." Apparently, this vocation was decided upon early in life, as life on the farm didn't appeal to him even then. When he was seventeen years old he left home and went to Detroit, Michigan, where he learned the telegraphic code. He then became a telegraph operator on the Grand Trunk railroad in Michigan and Ontario. While working at this, he still firmly maintained his intention of becoming a doctor, because every pay day half of his earnings was deposited in the bank and the other half was used for living expenses. When he thought that he had saved enough money, he went to Chicago, Illinois, where he attended the Chicago

Medical College from which he graduated in 1888 after three years of medical training. During these three years, ten cents was budgeted for breakfast, which consisted of one cup of coffee and two doughnuts eaten, daily, for three years. He believed that his digestive troubles in later years were due to the rather meagre diet while attending medical school.

After finishing medical college, he started to practice in Belding, Michigan. There less than a year, his wife of only a few months died. Shortly thereafter (1889), Dr. Wilson went to Duluth, Minnesota, where he opened an office at 20th Avenue West and Superior Street. He was married the second time in 1894; and, when his second wife died in 1898, he moved to Northfield, Minnesota, where he bought the office equipment of a Dr. Schmidt, who died of pneumonia the previous winter.

Soon after his arrival in Northfield, Dr. Wilson became the physician for the State Odd Fellows Home, located in Northfield. He persuaded the Board of Directors of this organization that a hospital would be a good thing for the Odd Fellows Home and for Northfield. Following plans, which Dr. Wilson drew, the Odd Fellows built and equipped a hospital in connection with the home. This was open for use by all the doctors in the community. In a few years the Odd Fellows Board decided they did not want to operate a hospital anymore. This distressed Dr. Wilson very much, because he and the other physicians were beginning to do considerable surgery. They needed a hospital. So Dr. Wilson organized the Northfield Hospital Association with the rest of the local doctors and some of the local citizens. Stock was sold and enough money raised to buy a large residence, to remodel it, and to equip it for hospital use. Dr. Wilson was the secretary and general manager of this institution from its beginning until it was taken over by the city nearly thirty years later and until a new city-owned hospital was built. During the whole period of the operation of the Northfield Hospital Association, Dr. Wilson saw to it that it never went into debt, that all bills were promptly paid, and that there was always a little surplus in the treasury. No funds were contributed to the Association other than those raised to start the hospital. The efforts expended by Dr. Wilson in the managing of this institution were a real altruistic contribution to the Northfield community.

In 1919, Dr. Wilson took Dr. Joseph Moses into partnership. Dr. Warren Wilson, his son, later joined the group. Dr. Warren Wilson, Sr., retired from active practice in 1926; but he maintained his interest in medical affairs by his concern over the success and the welfare of the new municipal hospital of Northfield. He also had a farm, to the management of which he devoted considerable time, perhaps evoked by a nostalgic longing for the Canadian farm of his childhood. Dr. Wilson was very active for many years in Northfield's Masonic bodies and a member of the Public School Board, of which he was the secretary for a number of years. During his years of active practice, he acquired a reputation as a good surgeon, and at one time was invited to join a medical group in a larger center as surgeon. He declined the offer because he thought he would enjoy life better, independent of some large organization. Dr. Warren Wilson suffered a fatal coronary insult in 1938. He was buried in Oaklawn Cemetery, Northfield.

Wood, George Weston.—Professor of diseases of the nervous system and of Medical jurisprudence at the University of Minnesota (1883-1887), a member of the Minnesota State Board of Medical Examiners, and State Senator (1887-89), Dr. George Weston Wood was the most outstanding medical man of his day in the town of Faribault and Rice County. *The History of Rice County,* edited by Charles S. Bryant, and published in the year 1882, contains the following biography:

"G. Weston Wood, M.D., one of the leading physicians of the city, was born in Canada, in Sheffield county, Quebec, on the 8th of May, 1842. His father was a cavalary officer of some prominence during the Canada insurrection in 1837, and was also engaged in manufacturing. G. Weston attended the Bishop's College at Lenoxville until sixteen years old, and one year later went to McGill College, where he graduated from the medical department on the 4th of May, 1863 (at the age of twenty-one). He was united in marriage on the 4th of July, 1868, with Miss Ella M. Fox. In 1873, they removed to Faribault, and one year later formed the present partnership of Rose & Wood. He has been County Coroner three terms and is now County Commissioner. He was mayor of the city in 1881, and is now surgeon of Shattuck School. They have three children, two boys and one girl."

George Weston Wood died on January 5, 1896, from leukemia, in his fifty-fourth year, after an illness of four years. Knowing the fatal nature of his affliction, he nevertheless carried on with his practice up to within less than four months of his own death, when repeated hemorrhages, their resultant anemias, and his weakness forced him into retirement. He was loved and respected by all who knew him (one or the other), for he was one of those upstanding and morally courageous men all must admire.

A medical history of Rice County would not be complete without at least a cursory history of the institutions caring for handicapped children.** It is one of the outstanding accomplishments of pioneer Minnesota that it recognized very early the care of these handicapped children as a public responsibility. From its inception the institutes for the education of the deaf, dumb, for the blind, and the feeble-minded were located in Faribault. The very beginnings go back to 1857 when the city of Faribault bought seventy acres of land and donated it to the territory as a site for a school for deaf children. The territory accepted it and the establishment of such a school was decided upon though no appropriations were voted until 1863. The sum set aside for this experimental school was only $1,500 and provided care and teaching only for indigent children. The results of the first year made such an impression that in the following year the legislature not only decided to continue the school, but repealed the indigent clause and opened it, besides to the deaf, also to all blind children of this state. In 1866 the sum of $10,000 was appropriated for a school building. The beginnings were small: in 1863 there were only eight deaf students, which number rose to twenty, twenty-three and twenty-eight during the successive three years. The first blind students were taken care of in 1866; only four in that and the following year. The establishment of the department for feeble-minded children did not materialize for many years although it had been suggested as early as 1869 and again in 1877. In 1879 the legislature authorized the Commissioners of Lunacy to select feeble-minded children from the Hospital for the Insane and transfer them to the Institute in Faribault. As this seemed unsatisfactory and an amendment to include *all* feeble-minded children was not passed until 1881, the feeble-minded department did not get under way until 1882.

The age limit for the deaf was from ten to twenty-five, but no such age limitation was placed upon the feeble-minded department. The department for the deaf always remained considerably larger than that for the blind. In 1870 the number of deaf students was sixty-one, of blind students fifteen. In 1875 the respective figures were 110 and twenty-two, and in 1880, 134 and thirty-five. One of the reasons was the fact the school for the deaf had much better and larger living quarters and classrooms than the school for the blind. In 1882, when there were 140 deaf and forty-six blind students, the institute had forty-one feeble-minded children—a small beginning, indeed, for an institution destined to become one of the largest in the state. In the 1930's the population of the deaf was consistently a little over

---

**Much of this history is taken from: Gioh-Fang Dju Ma, "One Hundred Years of Public Services for Children in Minnesota," University of Chicago Press, Chicago, 1948.

300, that of the blind between 100 and 130, while that of the feeble-minded (which now includes also adults) grew from 2,500 to over 3,000.

As to the men who help build up these schools, Jonathan Lovejoy Noyes was superintendent since 1866. After the reorganization in 1881 he could give his full attention to the teaching of the deaf. He was born in Windham, New Hampshire, on June 13, 1827, and graduated from Yale College in 1852. He had experience in the education of the deaf and dumb for fourteen years when he came to Faribault. He was succeeded, after serving thirty years, in 1896, by James Albertus Tate who held this position until 1924. Tate was born in Fulton, Missouri, on October 14, 1851, and graduated from Westminster College in 1873. He held the position of superintendent of the Missouri School for the Deaf before coming to Minnesota. The school for the Blind, now known as the Minnesota Braille and Sight Saving School, was under supervision of James Jabez Dow from 1875 until 1920—a period of forty-five years. He was born in Midapores, India, on February 15, 1848, where his parents worked as missionaries. He came to the United States as an infant, and to Minnesota in 1865, after serving two years with a Maine Cavalry Regiment during the Civil War. The need for the care and education of the feeble-minded had been set forth originally by Noyes, but Dr. J. H. Knight was concerned with the organization of that school from its beginning and he became its first superintendent.

And finally we wish to mention some pioneer pharmacists, who played a considerable part in the development of medical services in the county. There was not many pharmacists during the pioneer years, because many of the early physicians compounded and dispensed their own medicines and often owned and ran regular drug stores. The following list is no doubt incomplete:

Stephen Loveland Crocker came to Faribault in 1868. He was born in Genesce County, New York, December 12, 1855, and died in Denver, Colorado, on March 3, 1904.

Frank L. Glotzbach came to Minnesota in 1887 and settled in Faribault. He was born in Natrona, Pennsylvania, on August 11, 1872. In 1907 he was elected State Senator.

W. H. Stevens opened the first drug store in Faribault in 1856. He was born in Scipio, New York, on May 22, 1814. He studied medicine but it is not known whether he actually became a physician.

Acknowledgements

The writer gratefully acknowledges his obligations to the following persons, without whose friendly and helpful co-operation the house-bound invalid would have found this short medical history an impossible task: Mrs. Ina Smith (granddaughter of Dr. Nathan Marvin Bemis); the sisters Kahn; Mrs. Marie Lucile Hanson, who made many visits to the Buckham Memorial Library where the librarians put themselves out, time and again, in digging up old newsprint records for this medical history; Dr. F. R. Huxley; friends and neighbors, who furnished old books and recounted fragments of reminiscences out of the already dimming past even to them—all of Faribault; to Dr. Warren E. Wilson of Northfield; to Albert L. Sperry of Owatonna; and to the Chairman of the Historical Committee of the Minnesota State Medical Association, Dr. Robert Rosenthal.

References

Official Register of Physicians, Minnesota (1883-1890).
The History of Rice County (by Charles S. Bryant), published in the year 1882.
Nell Wood's Scrap Book (deceased wife of George Wood, D.D.S., son of George Weston Wood, M.D., also deceased).
Newspaper clippings (most of them undated).
A few physicians' cards, published as public notices in the local weekly press.
Obituaries.

Meetings and Announcements

MEDICAL MEETINGS

STATE

MINNESOTA STATE MEDICAL ASSOCIATION, 104th annual meeting, Saint Paul, May 13, 14 and 15, 1957.

NATIONAL

American College of Obstetricians and Gynecologists, fifth annual clinical meeting, Palmer House, Chicago, Illinois, November 7-9.

American College of Surgeons, sectional meeting, Hotels Lowry and St. Paul, St. Paul, Minnesota, April 8-10, 1957. Write Dr. H. Prather Saunders, Associate Director, American College of Surgeons, 40 East Erie St., Chicago 11, Illinois.

American Heart Association, 29th annual scientific session, Cincinnati, Ohio, October 26-29. Write American Heart Association, 44 East 23rd Street, New York 10, New York.

American Public Health Association, eighty-fourth annual meeting, Convention Hall, Atlantic City, New Jersey, November 12-16.

Centennial Exposition, Academy of Medicine of Cincinnati, Health Museum, Cincinnati, Ohio, February 27-March 5, 1957.

Centennial Exposition, 100th anniversary of the Academy of Medicine of Cincinnati, Music Hall, Cincinnati, Ohio, February 27-March 5, 1957.

Diseases of the Chest, ninth annual postgraduate course, Park-Sheraton Hotel, New York, New York, November 12-16.

Interstate Postgraduate Medical Association of North America, Municipal Auditorium, Cleveland, Ohio, October 22-25.

Milwaukee Academy of Medicine, symposium on immunology, Marquette University Brooks Memorial Union, Milwaukee, Wisconsin, December 1.

National Association for Music Therapy, seventh annual conference, Hotel Jayhawk, Topeka, Kansas, October 18-20.

National Society for Crippled Children and Adults, annual convention, Hotel Statler, Washington, D. C., October 28-31.

INTERNATIONAL

Inter-American Congress of Cardiology, Havana, Cuba, November 4-10. Dr. Ramon Aixala, Apartado 2108, Havana, Cuba.

Pan American Congress on Cancer Cytology, Miami, Florida, January 8-12, 1957. Dr. J. Ernest Ayre, chairman, 1155 N. W. 14th St., Miami, Florida.

Pan-Pacific Surgical Association, seventh congress, Honolulu, Hawaii, November 14-22, 1957. Write Dr. F. J. Pinkerton, director-general of the Pan-Pacific Surgical Association, Room 230, Young Building, Honolulu, Hawaii.

MINNESOTA SOCIETY OF NEUROLOGY AND PSYCHIATRY

The Minnesota Society of Neurology and Psychiatry held its regular meeting at the Town and Country Club in St. Paul on September 11. In the scientific program "A Follow-up of Patients Discharged from an In-patient Psychiatric Service" was presented by W. D. Wolking, W. Quast, Gloria Burian and Dr. Reynold A. Jensen. An inaugural thesis, "The Sexual Offender," was presented by Dr. Bernard C. Glueck, Jr.

NORTHERN MINNESOTA MEDICAL ASSOCIATION OFFICERS

At the annual meeting of the Northern Minnesota Medical Association at Alexandria on September 7 and 8, the following officers were elected for the coming year: Dr. Walter S. Neff, Virginia, president; Dr. Arnold Larson, Detroit Lakes, vice president, and Dr. C. L. Oppegaard, Crookston, secretary-treasurer.

CONTINUATION COURSES

October 22-24, 1956	Gynecology for General Physicians
November 5-9, 1956	Radiation Therapy for Radiologists
November 19-21, 1956	Fractures for General Physicians
December 6-8, 1956	Physical Medicine
January 7-9, 1957	Dermatology for General Physicians

For further information, write to the Director, Department of Continuation Medical Education, 1342 Mayo Memorial, University of Minnesota, Minneapolis 14.

COURSE IN ELECTROCARDIOLOGY

A course in practical electrocardiology will be presented December 3-7 in Houston, Texas, by Dr. Demetrio Sodi-Pallares, chief of the department of electrocardiology at the National Institute of Cardiology, Mexico City, under auspices of the University of Texas Postgraduate School of Medicine and Baylor University College of Medicine. Inquiries should be addressed to the University of Texas Postgraduate School of Medicine, Texas Medical Center, Houston 25, Texas.

HOWARD K. GRAY MEMORIAL FUND

The Howard K. Gray Memorial Fund, comprised of contributions made in memory of Dr. Gray, who was head of a section of surgery in the Mayo Clinic from 1935 until his death on September 6, 1955, is now administered by the Mayo Association. It is governed by a formal document which provides that the income and, if necessary, the principal, of the fund be used to provide grants to fellows or former fellows of the Mayo Foundation for purposes of travel and to satisfy other expenses incident upon visits by the recipients of traveling scholarships to leading surgical centers in the United States, territories of the United States and Canada.

The recipient of such a traveling scholarship from the Howard K. Gray Memorial Fund is selected by the Mayo Association. In practice, however, such a recipient will be nominated by a committee consisting of the director of the Mayo Foundation, the chairman of the Surgical Society of the Mayo Clinic, all surgeons who serve as members of the Board of Governors of the Mayo Clinic and such other persons as may be selected to act with them.

The contributions thus far accruing to the Howard K. Gray Memorial Fund is sufficient to assure a return income that will allow the recipient of a scholarship to spend at least two weeks at some American surgical center. It is hoped, however, that contributions to the memorial fund will continue to be made, so that the length of the visit of a scholarship recipient to a surgical center can be increased to more than the present two weeks.

JACK FRIEDMAN MEMORIAL LECTURE

The first Jack Friedman Memorial Lecture will be given on Thursday, November 29, 1956, at 8:15 p.m., in the Mayo Auditorium on the University of Minnesota Campus. The lecture will be presented by Dr. Leo G. Rigler, Professor and Head, Department of Radiology, whose subject will be "The Detection of Minimal Disease by Periodic Roentgen Examination."

Dr. Friedman, at the time of his death in 1955, was considered one of the Twin Cities' outstanding radiologists. His promising career was cut short by his untimely death. The lectureship, which is to be an annual event, is sponsored by a group of Dr. Friedman's friends and colleagues.

KENNY FOUNDATION SCHOLARSHIPS

The Sister Elizabeth Kenny Foundation announces a program of post-doctoral scholarships to promote work in the field of neuromuscular diseases. These scholarships are designed for scientists at or near the end of their fellowship training in either basic or clinical fields concerned with the broad problem of the neuromuscular diseases.

The Kenny Foundation scholars will be appointed annually. Each grant will provide a stipend for a five-year period at the rate of $5,000 to $7,000 a year. Inquiries should be addressed to Dr. E. J. Huenekens, Medical Director, Sister Elizabeth Kenny Foundation, 2400 Foshay Tower, Minneapolis 2, Minnesota.

Woman's Auxiliary

COUNTY OFFICERS OF THE WOMAN'S AUXILIARY

Blue Earth

President—Mrs. Chester E. Thiem, 122½ Moreland Ave., Mankato
Secretary-Treasurer—Mrs. Edgar E. Heller, 1038 E. Main Street, Mankato

Blue Earth Valley

President—Mrs. H. H. Russ, Blue Earth
Secretary-Treasurer—Mrs. George Drexler, Blue Earth

Brown

President—Mrs. C. A. Saffert, 509 S. Washington, New Ulm
Vice President—Mrs. Adolph Dysterheft, Gaylord
Secretary-Treasurer—Mrs. Peter J. Kitzberger, 825 N. Washington, New Ulm

Camp Release

President—Mrs. John H. Allen, 102 S. 12th Street, Montevideo
President-elect—Mrs. Ronald W. Barr, Montevideo
Secretary-Treasurer—Mrs. Norval Westby, 903 3rd Ave., Madison

Clay-Becker

Clay
President—Mrs. H. G. Rice, 1019 13th St. So., Moorhead
Secretary-Treasurer—Mrs. Carl Simison, Barnesville

Becker
President—Mrs. Arnold Larson, 1111 Minnesota Ave., Detroit Lakes
Secretary-Treasurer—Mrs. C. W. Moberg, 1239 Minnesota Ave., Detroit Lakes

East Central

President—Mrs. E. G. Hubin, Sandstone
Treasurer—Mrs. Gordon Tesch, Elk River

Freeborn

President—Mrs. Leo R. Prins, 215 Ridge Road, Albert Lea
Treasurer—Mrs. R. F. Schmidt, Alden

Goodhue

President—Mrs. William W. Liffrig, 1719 West 4th Street, Red Wing
Secretary-Treasurer—Mrs. John L. Falls, 1318 Red Oak, R.R. No. 2, Red Wing

Hennepin

President—Mrs. Arthur N. Russeth, 2301 Newton Ave. S., Minneapolis
President-elect—Mrs. Karl W. Anderson, Linwood Road, Rte. 3, Excelsior
Treasurer—Mrs. Robert Hebbel, 1510 Grantham St., St. Paul

Kandiyohi-Swift Meeker

President—Mrs. Lloyd Gilman, 908 Walnut Place, Willmar
Vice President—Mrs. Nelson Bradley, State Hospital, Willmar
Secretary—Mrs. Howard G. Bosland, 720 W. 8th St., Willmar
Treasurer—Mrs. Ernest Aulick, Belgrade

Lyon-Lincoln

President—Mrs. William C. Ferguson, Walnut Grove
Treasurer—Mrs. R. R. Remsberg, Tracy

McLeod
- *President*—Mrs. C. W. Truesdale, Glencoe
- *Treasurer*—Mrs. Milton M. Howell, Glencoe

Mower
- *President*—Mrs. Stanley Peterson, Box 482, Austin
- *Vice President*—Mrs. Wallace Anderson, 1614 Pinecrest, Austin
- *Secretary*—Mrs. P. A. Lommen, 309 Corbitt, Austin
- *Treasurer*—Mrs. George Stahl, 321A North Main, Austin

Nicollet-Le Sueur
- *President*—Mrs. Donald A. Limbeck, 137 Park Lane, Le Sueur
- *Treasurer*—Mrs. E. A. Ager, LeCenter

Olmsted-Houston-Fillmore-Dodge
- *President*—Mrs. G. R. Diessner, 29 Skyline Drive, Sunnyslopes, Rochester
- *Vice President*—Mrs. W. E. Wellman, 1127 Plummer Circle, Rochester
- *Secretary*—Mrs. James R. Doyle, 1416 4th St. S.E., Rochester
- *Treasurer*—Mrs. John Henderson, 932 10th St. S.W., Rochester

Park Region
- *President*—Mrs. Jay Kevern, Henning
- *Treasurer*—Mrs. Ralph Estrem, Fergus Falls

Ramsey
- *President*—Mrs. C. W. Froats, 1406 Edgcumbe Road, St. Paul
- *President-elect*—Mrs. Herman J. Wolff, 2245 Stanford Court, St. Paul
- *Treasurer*—Mrs. Benjamin F. Fuller, 260 Stonebridge Blvd., St. Paul

Red River Valley
- *President*—Mrs. John Cameron, 721 Pleasant, Crookston
- *Treasurer*—Mrs. Byron Kinkade, Ada

Renville-Redwood
- *President*—Mrs. A. W. Diessner, Redwood Falls
- *Treasurer*—Mrs. J. F. Haas, Fairfax

Rice
- *President*—Mrs. George N. Rysgaard, 420 Oak St., Northfield
- *Treasurer*—Mrs. J. G. Beaton, 614 Prairie Avenue, Northfield

St. Louis
- *St. Louis*
  - *President*—Mrs. E. E. Barrett, 1839 Woodland, Duluth
  - *President-elect*—Mrs. R. C. Pederson, 2419 E. 2nd St., Duluth
  - *Vice President*—Mrs. F. C. Jacobson, 2429 E. 3rd St., Duluth
  - *Secretary*—Mrs. John Haavik, 2530 E. 6th St., Duluth
  - *Treasurer*—Mrs. John C. Feuling, 2610 E. 6th St., Duluth
- *Range*
  - *President*—Mrs. A. V. Grinley, 1015 First Avenue N.E., Grand Rapids
  - *President-elect*—Mrs. Richard Barnes, Aurora
  - *Secretary*—Mrs. John B. Evensta, McGowen Addition, Grand Rapids
  - *Treasurer*—Mrs. G. W. Ireland, Nashwauk

Scott-Carver
- *President*—Mrs. Carl Heinzerling, Chaska
- *Treasurer*—Mrs. James Ponterio, Shakopee

Southwestern
- *President*—Mrs. Frederick L. Schade, Lake Ave., Worthington
- *President-elect*—Mrs. H. A. Christianson, Jackson
- *Treasurer*—Mrs. W. G. Benjamin, Pipestone

Stearns-Benton
- *President*—Mrs. Karl A. Walfred, 807 2nd Ave. S., St. Cloud
- *Treasurer*—Mrs. S. J. Raetz, Maple Lake

Steele
- *President*—Mrs. John Fischer, Blooming Prairie
- *Secretary-Treasurer*—Mrs. K. G. Henry, 915 N.E. 14th St., Owatonna

Upper Mississippi
- *President*—Mrs. Robert Pedersen, 315 Bluff Avenue, Brainerd
- *Treasurer*—Mrs. Carl Coombs, Cass Lake

Wabasha
- *President*—Mrs. Robert N. Bowers, Lake City
- *Secretary-Treasurer*—Mrs. E. Covell Bayley, Lake City

Waseca
- *President*—Mrs. R. C. Hottinger, Janesville
- *Treasurer*—Mrs. M. C. Florine, Janesville

Washington
- *President*—Mrs. R. E. Carlson, 623 S. Broadway, Stillwater
- *Vice President*—Mrs. John Stuhr, Stillwater
- *Treasurer*—Mrs. D. Kalinoff, 712 S. Second Street, Stillwater

West Central
- *President*—Mrs. Homer Hedemark, Ortonville
- *Secretary-Treasurer*—Mrs. Truman Hedemark, Ortonville

Winona
- *President*—Mrs. R. H. Wilson, 724 Washington, Winona
- *Secretary*—Mrs. Howard Satterlee, Lewiston
- *Treasurer*—Mrs. C. W. Rogers, 378 Main, Winona

Wright
- *President*—Mrs. William Thomas, Howard Lake
- *Vice President*—Mrs. F. E. Ellison, Monticello
- *Treasurer*—Mrs. P. J. Guilfoile, Delano

* * *

Contributions for this column, including news and activities of state auxiliaries and items of interest about members, may be sent to Mrs. A. B. Rosenfield, Woman's Auxiliary Editor, MINNESOTA MEDICINE, 2920 Dean Boulevard, Minneapolis, Minnesota.

FILMS AVAILABLE

A revised list of films available through the AMA motion picture library has been prepared and copies are available upon request from Motion Pictures and Medical Television of the American Medical Association. This catalog lists eighty-nine medical films suitable for showing to medical societies, hospital staff meetings and other scientific groups. The catalog also includes forty-five health films of interest to physicians who may be called upon to speak before lay audiences such as service organizations, Parent-Teachers' Associations, and others.

A RESEARCH MILESTONE

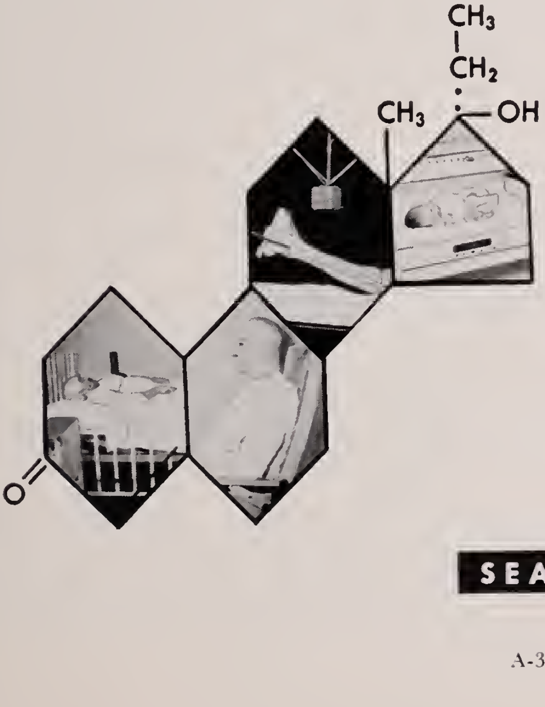
Nilevar*

(BRAND OF NORETHANDROLONE)

Searle's New and Practical Steroid Specifically for Protein Anabolism–

It has long been recognized that a substance which would promote protein anabolism would be of inestimable value in therapy. The androgens have this property, but unfortunately they also exert actions on secondary sex characteristics. These effects are commonly undesirable in therapeutic programs.

THE FIRST STEROID WITH ANABOLIC SPECIFICITY—Nilevar, the newest Searle Research development, therefore, meets a long desired clinical need because Nilevar presents the first steroid primarily anabolic for protein synthesis. Moreover, Nilevar is without prominent androgenic effects (only about one-sixteenth of that exerted by the androgens).



OBJECTIVE AND SUBJECTIVE RESPONSE — Orally effective, Nilevar therapy is characterized by retention of nitrogen, potassium, phosphorus and other electrolytes in ratios indicative of protein anabolism. Moreover, subjectively the patient observes an increase in appetite and sense of well-being.

WELL TOLERATED—Nilevar has an extremely low toxicity. Laboratory animals fail to show toxic effects after six months of continuous administration of high dosages. Nilevar should not be administered to patients with prostatic carcinoma. Nausea or edema may be encountered infrequently. Slight androgenicity may be evidenced on high dosage or in particularly responsive individuals.

MAJOR INDICATIONS—Preparation for and recovery from surgery; supportive treatment of serious illnesses (pneumonia, poliomyelitis, carcinomatosis, tuberculosis); recovery from severe trauma and burns; decubitus ulcers; care of premature infants.

DOSAGE—The daily *adult* dose is three to five Nilevar tablets (30 to 50 mg.) but up to 100 mg. may be administered. For *children* the average daily dose is 1 to 1.5 mg. per kilogram of body weight; individual dosages depend on need and response to therapy.

SUPPLY—Nilevar is available in uncoated, unscored tablets of 10 mg. G. D. Searle & Co., Research in the Service of Medicine.

*Trademark of G. D. Searle & Co.

SEARLE

Cleans like magic . . . no more scrubbing with

KLER-RO®

ULMER

For surgical instruments, laboratory glassware, rubber goods and linens.

Soaks clean . . . removes dried blood, pyrogens, plasma, serums and mucus . . . eliminates necessity of hand scrubbing.

Will not etch glassware, leaves it sparkling clean. Will not pit stainless steel. Has a nearly neutral pH. Kler-ro does not cake but dissolves quickly and is safe and economical to use.

Write for free sample and brochure today . . . MM-1056b

Physicians & Hospitals Supply Co.

1400 Harmon Place • Minneapolis 3, Minn.

In Memoriam

ARTHUR H. LANGHOFF

Dr. Arthur H. Langhoff, Mankato, Minnesota, neuropsychiatrist, died at his home, June 20, 1956. He was sixty-six years old.

Dr. Langhoff was born in Blue Earth County, April 22, 1890. He graduated from the University of Minnesota Medical School in 1921 and interned at Swedish Hospital in Minneapolis. He was in general practice in Glencoe, Minnesota, for twenty-two years before specializing in neuropsychiatry which he practiced in Mankato the past seven years.

He was consulting psychiatrist for the Veterans' Administration in the Mankato area, and a member of the staff of St. Joseph's Hospital, Mankato. He belonged to the Blue Earth County Medical Society, the Minnesota State Medical Association, and the American Medical Association.

Dr. Langhoff is survived by his wife, a daughter, Evangeline (Mrs. James L. Jaeck), and three grandchildren, all of La Crosse, Wisconsin.

OSCAR E. NELSON

Dr. Oscar E. Nelson, a former Minneapolis physician, died recently at Stewart, Minnesota. He was seventy-nine years old.

Survivors include his wife, Helen; a son, Robert S., Whittier, California; three brothers, Theodore, Anoka; Dr. D. E., Alexandria; Arthur W., Edina, and two grandchildren.

HELMER JONAS NILSON

Dr. Helmer J. Nilson, a member of the council of the Minnesota State Medical Association, died August 31, 1956, in Mankato where he had practiced medicine for over twenty years. He was sixty-three years old.

As fourth district councilor of the Association, Dr. Nilson was also second district public health officer.

A native of Bollnas, Sweden, he came to the United States in 1912. After serving in World War I, he entered Gustavus Adolphus College, St. Peter, Minnesota, to study bacteriology. In 1927, he entered the University of Minnesota medical school from which he was graduated in 1932. He interned at University Hospitals, Minneapolis, and then practiced medicine at Tracy, Minnesota, for two years. In 1935 he moved to North Mankato where he practiced until his death.

Dr. Nilson was a member of the Nicollet-Le Sueur Medical Society, as well as the state medical association and the American Medical Association. He was also a past-president of the Southern Minnesota Medical Association and on the staffs of Immanuel and St. Joseph's Hospitals in Mankato.

Long active in public and community affairs, Dr. Nilson was a member of the Grace Lutheran Church, a past president of the Mankato Lions Club, a member of the American Legion, director of student health service at Gustavus Adolphus College, and also a member of the North Mankato Civic and Commerce Association.

He was instrumental in organizing the student nurse program at Mankato State Teachers College.

Survivors include his wife, Helen; one daughter, Barbara Virginia (Mrs. C. M. Christensen); two sons, Thor Curtis, Albuquerque, New Mexico; Ronald Robert, North Mankato; and six grandchildren. He is also survived by two brothers: the Reverend Lars Nilson and Professor Per Nilson, and one sister, Mrs. Stina Anderson, all of Sweden.

A. E. SOHMER

Dr. A. E. Sohmer, former fourth district councilor for the Minnesota State Medical Association and one of the founders of the Mankato Clinic, died September 3, 1956. He was seventy-seven years old.

Dr. Sohmer was honored for fifty years in the practice of medicine in 1949, and retired from active practice in Mankato in 1951.

A native of New York City, Dr. Sohmer graduated from Long Island Medical College in 1899 and interned at Lenox Hill Hospital in New York City. In 1949 he attended the fiftieth anniversary of his graduating class and received a medal.

A surgeon, he was present when Dr. Willy Meyer, famous eastern physician, administered the first spinal anesthesia given in the United States in 1901 in New York.

Dr. Sohmer was on the staffs of St. Joseph's and Immanuel Hospitals, Mankato, a fellow of the American College of Surgeons, a member of the North Central Branch of the American Urologic Association as well as a past president of the Blue Earth County Medical Society and of the Southern Minnesota Medical Association. He was also a vice-president of the state medical association and a member of the American Medical Association.

Survivors include his wife, Lillian; three daughters—Mrs. Alfred Etchinson, San Juan, Puerto Rico; Mrs. Roger Young, Mankato, and Mrs. David Svahn, Nyack, N. Y.; one son, Edward, Newark, N. J.; a brother, A. V. Sohmer, Mankato, and ten grandchildren.

THE BANK WHERE YOU FEEL AT HOME

the AMERICAN
NATIONAL BANK OF SAINT PAUL
MEMBER FEDERAL DEPOSIT INSURANCE CORPORATION

the New
P & H arm sling...

especially designed
for PATIENT COMFORT

P&H

- Cool and comfortable
- Preshrunk cotton drill . . . washable
- All hardware anti-corrosive

The P & H sling can be applied easily . . . without effort or fuss. It eliminates the problem of complicated slings requiring special adjustments, pins and knots. It is complete within itself to assure patient comfort. The sling is fully adjustable to any arm position and fits either the right or left arm. Adult and child sizes.

Physicians & Hospitals Supply Co.
1400 Harmon Place Minneapolis 3, Minn.

General Interest

Dr. A. B. Rosenfield, director of special services for the Minnesota Department of Health, was awarded a certificate for outstanding public safety service by the Minnesota Safety Council at an August 24 meeting in Duluth.

* * *

Dr. M. W. Comfort and **Dr. J. A. Bargen**, Rochester, both attended the International Congress of Gastroenterology in London in July, and each presented a paper.

* * *

Dr. H. J. Moersch, Rochester, was awarded the West German Cross of Merit as an outstanding specialist in the field of thorax diseases at a recent meeting of the International Congress of the American College of Chest Physicians in Cologne, Germany.

Also honored at the Cologne Congress was **Dr. J. A. Myers**, professor of medicine and public health at the University of Minnesota. He was awarded the Varrier-Jones medal for international contributions to tuberculosis knowledge and control.

Dr. James R. Fox, Minneapolis, also attended the Cologne meeting and presented a paper.

* * *

Dr. Charles W. Mayo, Rochester, was honored at a surprise anniversary dinner recently by a group of physicians who have served as his first assistants during the past twenty-five years. The dinner was attended by seventeen of Dr. Mayo's forty-one former assistants. They presented him with an inscribed sterling silver serving tray.

* * *

Two Drs. Meyerding were honored at the International College of Surgeons meeting in Chicago on September 11. **Dr. Eugene V. Meyerding**, formerly of St. Paul and now of Medford, Oregon, was elected a member of the United States section, and his uncle, **Dr. Henry W. Meyerding**, Rochester, was named president-elect of the international group.

* * *

Dr. Frances Elizabeth Schaar, Minneapolis, attended the Sixth International Congress of the Society of Hematology in Boston recently.

* * *

Dr. John R. Watson and **Dr. John E. Verby**, staff members of the Olmsted Community Hospital, Rochester, presented a paper at a meeting of the Olmsted-Houston-Fillmore-Dodge Counties Medical Society in Rochester on September 5. Title of the paper was "Spontaneous Rupture of the Post-cesarian Uterus."

* * *

After thirty-seven years of practice in the Stewart community, **Dr. W. W. Klima** announced his retirement late this summer. The reason for his decision was ill health. Dr. Klima began practice in Stewart in 1919. During the seventy-seven year history of the town, Stewart has had only two full-time physicians, Dr. Klima and previously **Dr. C. W. Tinker**.

A medical press panel entitled "Press and Patients" was a feature of the annual fall meeting of the Minnesota Associated Press in Rochester on September 22. Appearing on the panel discussion from the Mayo Clinic were **Dr. C. H. Millikan, Dr. James Eckman** and **H. A. Blackman.** Representing the press on the panel were **G. A. Nordin** of the *Duluth Herald and News-Tribune,* **W. P. Steven** of the *Minneapolis Star and Tribune,* and **Gordon Closway** of the *Winona Daily News.*

* * *

The Ford Foundation has announced grants totaling $21,750,000 to strengthen instruction in the forty-four privately-supported medical schools now in operation in the United States. The grants are in the amount of $500,000 to each of forty-three four-year institutions and $250,000 to the two-year medical school at Dartmouth College, Hanover, N. H. They were recommended by a special advisory committee, which was set up by the foundation to develop plans for distributing $90,000,000 which the foundation appropriated last December to aid the instructional programs of the private medical schools.

The grants are to be held by the recipient institutions as invested endowment for at least ten years. During this time the income from the endowment may be expended for instructional purposes. Excluded from purposes of the grants are construction and research needs. After a ten-year period, the medical schools will be free to use the principal sum as well as endowment income. In announcing the grants the Foundation indicated it expects to disburse the balance of the $90,000,000 appropriation during the current academic year.

* * *

Dr. F. T. Becker, Duluth, was guest lecturer at a meeting of the Indiana Dermatological Society on September 12.

* * *

Dr. Donald J. Nollet, Hibbing, recently attended a meeting of the Association of Blood Banks in Boston.

* * *

Dr. R. P. Pearsall, Virginia, was guest of honor at a dinner celebrating his eightieth birthday on August 29. Dr. Pearsall has been a practicing physician since 1904 and city health officer of Virginia for more than twenty-five years.

* * *

Dr. Anderson C. Hilding, Duluth, visited medical centers in Europe during the month of September. During the trip he addressed the Collegium Oto-Rhino-Laryngologicum, where he presented a paper entitled "Possible Relation of the Manner of Deposition and Disposition of Cigarette Smoke in the Bronchial Tree to Cancer."

* * *

Dr. W. Barry Wood, Jr., vice president of the Johns Hopkins University and the Johns Hopkins Hospital,

for preventing and treating upper respiratory infections . . .

Achrocidin*

Tetracycline-Antihistamine-Analgesic Compound

ACHROCIDIN is a comprehensive formula for treatment of complications of the common cold, particularly when bacterial sequelae are observed or expected from the patient's history or during widespread infections.

Distressing symptoms of malaise, headache, muscular pain, mucosal and nasal discharge are rapidly relieved.

And potent prophylaxis is offered against other diseases, such as otitis media, sinusitis, adenitis, and bronchitis, to which the patient may be highly vulnerable at this time.

ACHROCIDIN is convenient for you to prescribe—easy for the patient to take. Average adult dose: two tablets four times daily.

Available on prescription only

Each tablet contains:

ACHROMYCIN® Tetracycline	125 mg.
Phenacetin	120 mg.
Caffeine	30 mg.
Salicylamide	150 mg.
Chlorothen Citrate	25 mg.

Bottle of 24 tablets

Lederle LEDERLE LABORATORIES DIVISION, AMERICAN CYANAMID COMPANY, PEARL RIVER, N. Y.

*TRADEMARK

'ANTEPAR'®*

for "This Wormy World"

PINWORMS

ROUNDWORMS

***SYRUP OF 'ANTEPAR'** Citrate brand Piperazine Citrate

Bottles of 4 fluid ounces, 1 pint and 1 gallon.

***TABLETS OF 'ANTEPAR'** Citrate brand Piperazine Citrate

250 mg. or 500 mg., Scored

Bottles of 100.

Pads of directions sheets for patients available on request.

BURROUGHS WELLCOME & CO. (U. S. A.) INC.
Tuckahoe, New York

Baltimore, Maryland, gave the Judd-Plummer Memorial Lecture on September 28 during the thirty-second annual meeting of the Alumni Association of the Mayo Foundation in Rochester. Dr. Wood spoke on "Studies on Inflammation and Fever."

* * *

Dr. Henry E. Michelson, Minneapolis, professor of medicine at the University of Minnesota, delivered the first annual Paul A. O'Leary Memorial Lecture at the Mayo Clinic, Rochester, on September 8 during the meeting of the Minnesota Dermatological Society. His subject was "A Consideration of Some Diseases of the Subcutaneous Fat." The lectureship was established in 1955 in memory of Dr. Paul A. O'Leary, who for many years was head of the Section of Dermatology of the Mayo Clinic.

* * *

Dr. C. Elinor Trandem, staff member of the Rochester State Hospital for the past twenty years, has retired from state service and has moved to the Pacific coast. She was honored by hospital employes at a gathering in the Nurses Home on September 20, attended by 300 persons. A native of St. Paul, Dr. Trandem received her medical degree at the Woman's Medical College in Pennsylvania. She practiced at Plula, Pa., before joining the Rochester State Hospital staff in 1936.

NEW LOCATIONS

Dr. Theodore Baker, formerly of Kingston, Pa., has joined the staff of St. Olaf Hospital, Austin, as pathologist.

* * *

Dr. John Haskins, formerly of West Los Angeles, Calif., has been transferred to Minneapolis and has been appointed area chief of psychiatry and neurology for the Veterans Administration hospitals.

* * *

Dr. Harold R. Adams, who recently completed a residency in obstetrics and gynecology at Kings County Hospital, Brooklyn, New York, and Hartford Hospital, Hartford, Conn., has become associated in practice with **Dr. Jane E. Hodgson** in St. Paul.

* * *

Dr. Mary Teberg, a former instructor in psychiatry at the University of Minnesota, has been appointed to the staff of the Hamm Memorial Psychiatric Clinic in St. Paul, according to an announcement by **Dr. Clarence J. Rowe**, clinic director.

* * *

Dr. Ray Johnson, formerly of Breckenridge, has become associated in practice with **Dr. J. J. Ahlfs** at Caledonia.

* * *

Dr. Marvin L. Stern, formerly of Manitoba, has opened offices for the practice of medicine at Mahnomen.

* * *

Dr. Vincent Paciotti has become associated with **Dr. Bernard Halper** in the practice of radiology at the Hibbing General Hospital.

MINNESOTA BLUE SHIELD-BLUE CROSS

The Minnesota Blue Shield Professional Relations Staff made 2,181 calls at doctors' offices throughout the State during the first six months of 1956, and over 600 calls resulted in personal visits with doctors. The professional relations program, the liaison between the medical profession and Blue Shield, has been effective in informing doctors and their office personnel of Blue Shield developments. At the same time, it enables Blue Shield to obtain the viewpoints of hundreds of physicians throughout Minnesota. For this reason, Blue Shield's aim of better service to the profession and the public is greatly assisted by the professional relations program.

Professional relations activities are carried on not only in doctors' offices, but also through Blue Shield telephone information service. A survey of telephone inquiries made during July of 1956, indicates that of over 1,200 calls received during the twenty-two working days of July, 1956, nearly 20% were from doctors' offices. The survey was conducted to determine methods by which telephone information can be given most effectively and to classify for Blue Shield those matters about which inquiries are most frequently received. With this knowledge, Blue Shield can serve the medical profession better. Moreover, those portions of the Blue Shield contract about which inquiries are most frequently received can be discussed and clarified through professional and public relations activities as well as by check stuffers, bulletins, and other literature, which are also features of the professional relations program.

During the first six months of 1956, the Blue Cross Hospital Relations Department made 312 calls on Blue Cross member hospitals of which there are 174 in Minnesota. The department attempts to make calls quarterly and oftener when necessity and expediency dictate. Through such calls Blue Cross is able to meet the problems of the hospitals and to present the Blue Cross operation to the hospitals.

The activities of the department are aimed at keeping the member hospitals as completely informed as possible as to their relationship and progress with Blue Cross. In meetings with hospital board members, the Hospital Relations Department acquaints the governing bodies of the member hospitals with Blue Cross and the relationship of the individual hospital to Blue Cross.

During such meetings when problems arise mutually affecting both Blue Cross and the hospital, solutions can often be obtained through their co-operative efforts or by clarification of policy through which misunderstandings have arisen. By co-operating closely with the hospitals, recognizing and meeting as much as possible their needs, Blue Cross strives to be of service to the hospital and to the public.

Through discussion of problems, large and small, hospitals and Blue Cross can arrive at solutions which help design plans in keeping with present hospital costs. The hospital-Blue Cross relationship is of the utmost importance when one considers that the need for a low-cost prepaid hospitalization plan will always be with us.

Results With

'ANTEPAR'®*

against **PINWORMS**

In clinical trials, over 80% of cases have been cleared of the infection by one course of treatment with 'Antepar.'

Bumbalo, T. S., Gustina, F. J.,
and Oleksiak, R. E.:
J. Pediat. 44:386, 1954.

White, R. H. R., and
Standen, O. D.:
Brit. M. J. 2:755, 1953.

against **ROUNDWORMS**

"Ninety per cent of the children passed all of their ascarides . . ."

Brown, H. W.:
J. Pediat. 45:419, 1954.

***SYRUP OF 'ANTEPAR'** Citrate brand Piperazine Citrate

Bottles of 4 fluid ounces, 1 pint and 1 gallon.

***TABLETS OF 'ANTEPAR'** Citrate brand Piperazine Citrate

250 mg. or 500 mg., Scored

Bottles of 100.

Pads of directions sheets for patients available on request.

BURROUGHS WELLCOME & CO. (U.S.A.) INC.
Tuckahoe, New York

A P H
OMAHA
A P C
OMAHA

the Emblems of RELIABLE PROTECTION

We cordially invite your inquiry
for application for membership
which affords protection against
loss of income from accident and
sickness as well as benefits for
hospital expenses for you and
all your dependents.

ALL PREMIUMS COME FROM
PHYSICIANS SURGEONS DENTISTS
ALL BENEFITS GO TO

$4.500.000 ASSETS
$23.800.000 PAID FOR BENEFITS
SINCE ORGANIZATION

Since 1902

**PHYSICIANS CASUALTY
AND
HEALTH ASSOCIATIONS**
OMAHA 2, NEBRASKA

Book Reviews

Books listed here become the property of the Ramsey, Hennepin and St. Louis County Medical Libraries when reviewed. Members, however, are urged to write reviews of any or every recent book which may be of interest to physicians.

COMMON CONTAGIOUS DISEASES—Fifth Edition. Philip Moen Stimson, A.B., M.D., Professor of Clinical Pediatrics, Cornell University Medical College; Consulting Pediatrician: New York and Roosevelt Hospitals and Hospital for Special Surgery (New York City) and Meadowbrook (Hempstead), Bergen County (Bergen Pines). Norwegian Lutheran (Brooklyn), Horton Memorial (Middletown) and St. Francis (Poughkeepsie) Hospitals; President of St. John's Guild (The Floating Hospital); formerly Attending Physician, Willard Parker Hospital and Director of the former Poliomyelitis Service of Knickerbocker Hospital; and Horace Louis Hodes, A.B., M.D., Pediatrician-in-Chief and Director of the Department of Pediatrics, Mt. Sinai Hospital, New York City; Clinical Professor of Pediatrics, College of Physicians and Surgeons at Columbia University; Consulting Pediatrician, North Shore Hospital; formerly Assistant in Pathology and Bacteriology Rockefeller Institute for Medical Research, Associate Professor of Pediatrics. Johns Hopkins Medical College, and Director of Sydenham Hospital. Baltimore. 624 pages. Illus. Price $8.50, flexible binding. Philadelphia: Lea & Febiger, 1956.

CHRONIC ILLNESS IN THE UNITED STATES. Volume II. Care of the Long-term Patient. By the Commission on Chronic Illness. 606 pages. Price $8.60, cloth. Cambridge: Published for the Commonwealth Fund by the Harvard University Press, 1956.

ARMED FORCES MEDICAL LIBRARY

The Armed Forces Medical Library was transferred October 1, 1956, to the Public Health Service, Department of Health, Education, and Welfare.

The National Library of Medicine Act, signed by President Eisenhower on August 3, establishes a National Library of Medicine in the Public Health Service "to assist the advancement of medical and related sciences and to aid the dissemination and exchange of scientific and other information important to the progress of medicine and to public health." The Armed Forces Medical Library will form the nucleus of the National Library.

The Armed Forces Medical Library was founded in 1836 as the Library of the Surgeon General's Office, U. S. Army. Today it is one of the largest and most important medical libraries in the world. It contains almost a million volumes, representing literature on medicine, dentistry, pharmacy and allied sciences in all languages and of all times.

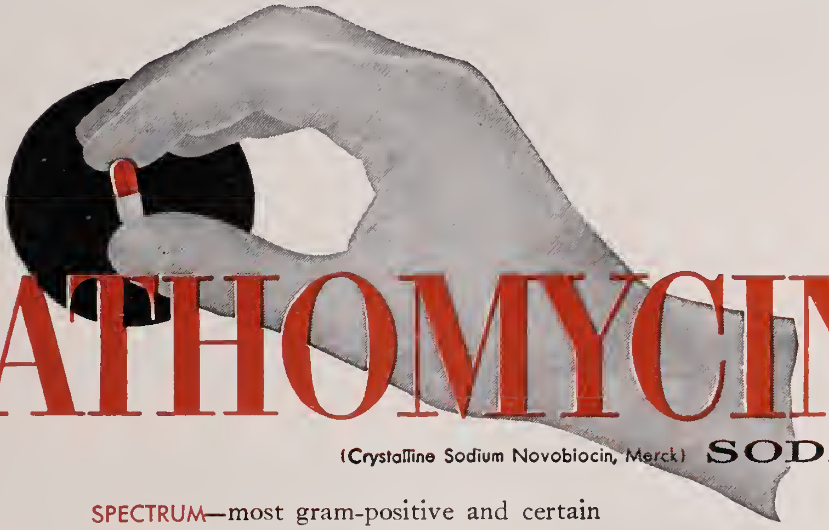
In administering the National Library of Medicine, the Surgeon General of the Public Health Service will be assisted by a Board of Regents consisting of ten persons to be appointed by the President and confirmed by the Senate. Ex officio members of the Board will be the Surgeons General of the Public Health Service, the Army, Navy and Air Force, the Chief Medical Director of the Department of Medicine and Surgery of the Veterans' Administration, the Assistant Director for Biological and Medical Sciences of the National Science Foundation, and the Librarian of Congress.

The National Library of Medicine Act also authorizes the construction of adequate facilities to house the Library on a site to be selected by the Surgeon General of the Public Health Service at the direction of the Board of Regents.

NOW AVAILABLE...

a unique new antibiotic of major importance

PROVED EFFECTIVE AGAINST SPECIFIC ORGANISMS
(staphylococci and proteus)
RESISTANT TO ALL OTHER ANTIMICROBIAL AGENTS



'CATHOMYCIN'

(Crystalline Sodium Novobiocin, Merck) **SODIUM**

SPECTRUM—most gram-positive and certain gram-negative pathogens.

ACTION—bactericidal in optimum concentration even to resistant strains.

TOXICITY—generally well tolerated. This is more fully discussed in the package insert.

ABSORPTION—oral administration produces high and easily-maintained blood levels.

INDICATIONS—cellulitis, pyogenic dermatoses, septicemia, bacteremia, pneumonia and enteritis due to *Staphylococcus* and infections involving certain strains of *Proteus vulgaris*, including strains resistant to all other antibiotics.

DOSAGE—Two capsules (500 mg.) twice daily or one capsule (250 mg.) four times a day.

SUPPLIED—250 mg. capsules of 'CATHOMYCIN', bottles of 16.

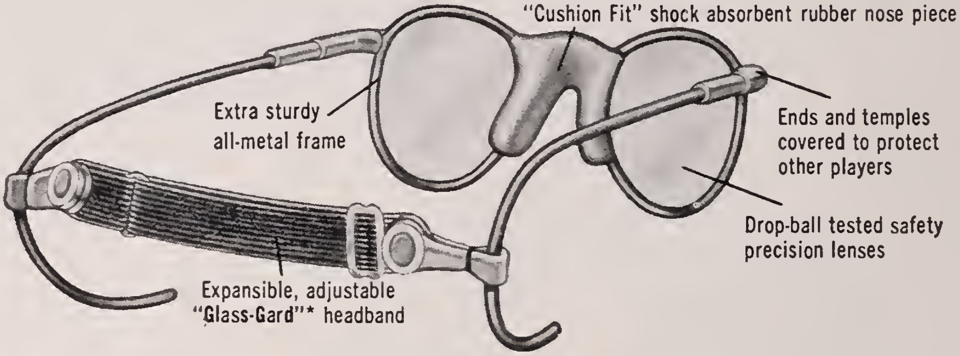
'CATHOMYCIN' *is a trademark of Merck & Co., Inc.*

MSD
MERCK SHARP & DOHME
DIVISION OF MERCK & CO., INC.
PHILADELPHIA 1, PA.

This fall and winter... prescribe Benson's

ALL AMERICAN* ATHLETIC GLASSES

Designed for rough treatment


"Cushion Fit" shock absorbent rubber nose piece
Extra sturdy all-metal frame
Ends and temples covered to protect other players
Drop-ball tested safety precision lenses
Expansible, adjustable "Glass-Gard"* headband

Your athlete patients will receive maximum comfort and protection during competition if they wear **ALL AMERICAN * ATHLETIC GLASSES** ... practical and useable on all noses for almost every sport.

Prices on request. A complete sample may be ordered at nominal cost from your supplier or BENSON OPTICAL COMPANY.

For your protection and ours, look for the trademark A-A on the lenses of every pair of **ALL AMERICAN* ATHLETIC GLASSES.**

**Copyright*

Since 1913 Benson OPTICAL COMPANY **Executive Offices • Minneapolis 2, Minn.**

LABORATORIES CONVENIENTLY LOCATED IN UPPER MIDWEST CITIES

For complete gall bladder regimen...

Colicell

A single COLICELL tablet is more effective for a longer period and is carefully coated to prevent gastric disturbance. In bottles of 100 and 1000 tablets.

Each Tite-Coat Red Tablet Contains:

Extracts of Whole Bile (Equal parts Ox and Hog)	210.0 mg.
Ketocholanic Acids (Oxidized or keto form of normally occurring bile acids containing approximately 93% dehydrocholic acid)	90.0 mg.
Methyl Cellulose	130.0 mg.
Homatropine Methylbromide	2.5 mg.

SAMPLES AND LITERATURE ON REQUEST

SUTLIFF & CASE COMPANY, INC.

Pharmaceutical Specialties • **PEORIA, ILLINOIS**

SINCE 1883

to quiet the cough

and calm the patient

INTEGRATED ACTION

1. Topical anesthetic action
more powerful than that of cocaine

2. Antihistaminic action
to help control cough, bronchial spasm, and allergy-caused congestion

3. Sedative action
to allay nervous irritability

4. Expectorant action
to render the cough productive by aiding the secretion of protective mucus

PHENERGAN®

EXPECTORANT

Promethazine Expectorant with Codeine; Plain (without Codeine)

Wyeth®
Philadelphia 1, Pa

MONODRAL® WITH MEBARAL®

psychovisceral
stabilizer

ANTICHOLINERGIC • SEDATIVE

in peptic ulcer management

- **relieves pain promptly**
- **reduces tension safely**
- **tranquilizes without dulling**
- **well tolerated**
- **promotes healing**
- **maintains anacidity for hours**
- **controls hyperactivity of upper gastro-intestinal tract**

MONODRAL with MEBARAL—the "psychovisceral stabilizer"—provides for patients with ulcer and gastro-intestinal spasm an effective barrier against the impact of environmental stimuli . . . controls gastric hypersecretion and hypermotility for three and one half to five hours.*

EACH TABLET CONTAINS:
MONODRAL bromide..... 5 mg.
MEBARAL..............32 mg.

DOSAGE: 1 or 2 tablets three or four times daily.
Available on prescription only.
Bottles of 100 tablets.

Winthrop Laboratories New York 18, N. Y.

Monodral (brand of penthienate) and Mebaral (brand of mephobarbital), trademarks reg. U. S. Pat. Off.
**References and clinical trial supplies available on request.*

"The mercurial diuretics have the justified reputation of being the most powerful and consistently effective of all diuretic drugs."*

TABLET
NEOHYDRIN®

*Goodman, L. S., and Gilman, A.: The Pharmacological Basis of Therapeutics, ed. 2, New York, The Macmillan Company, 1955, p. 847.

07756

ANNUAL
CLINICAL
CONFERENCE

Chicago Medical Society

March 5, 6, 7 and 8, 1957

Palmer House, Chicago

Lectures *Daily Teaching Demonstrations*
Medical Color Telecasts

The CHICAGO MEDICAL SOCIETY ANNUAL CLINICAL CONFERENCE should be a MUST on the calendar of every physician. Plan now to attend and make your reservation at the Palmer House.

New STEELINE Pediatric Table

Eases the burden of the physician's daily work

Includes built-in tare balance scale, built-in measuring rod, foam rubber cushion and electrical outlets with cord and plug—there are no accessories to buy. Top quality construction features include all-welded steel body, two roomy drawers and a large open compartment with shelf, providing easy, unhampered access to instruments and supplies. Front edge is protected from wear by a stainless steel baffle plate. Despite the fact that this new table has been designed to provide the physician with the best modern equipment, efficient modern production methods in our own factory permit us to keep the price well below that of comparable models. Write today for complete information.

a. s. aloe company OF MINNESOTA
927 Portland Avenue, Minneapolis 4, Minn. • Phone:

---

for your complete insurance needs . . .

☆ **PROFESSIONAL**
☆ **PERSONAL**
☆ **PROPERTY**

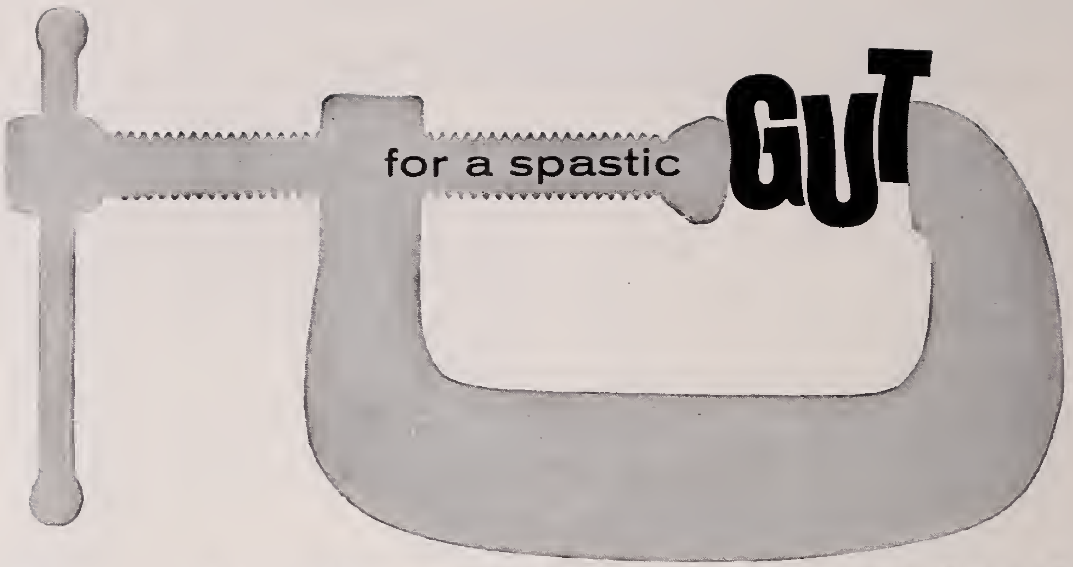
CHOICE OF THE MINNESOTA MEDICAL ASSOCIATION FOR PROFESSIONAL LIABILITY INSURANCE

THERE IS A ST. PAUL AGENT IN YOUR COMMUNITY AS CLOSE AS YOUR PHONE

HOME OFFICE
111 West Fifth Street
Saint Paul 2, Minnesota

The St. Paul Companies
INSURANCE
LAND • SEA • AIR
FOUNDED 1853

St. Paul Fire and Marine Insurance Co.
St. Paul Mercury Insurance Co.
St. Paul Mercury Indemnity Co.



Trasentine®-Phenobarbital

integrated relief . . .
mild sedation
visceral spasmolysis
mucosal analgesia

TABLETS *(yellow, coated), each containing 50 mg. Trasentine® hydrochloride (adiphenine hydrochloride CIBA) and 20 mg. phenobarbital.*

C I B A
Summit, N. J.

2/2226M

"Patients without primary renal disease, but with albuminuria and high nonprotein nitrogen due to congestive circulatory changes, can be adequately and safely treated with Neohydrin for long periods of time."*

*Griffith, G. C.; Dimitroff, S. P., and Thorner, M. C.: Ann. Int. Med. 45:7, 1956.

07656

NEW!
Patented HANSEN
Split Frame Truss

Positive Hernia Control

Contoured Spring Design Gives
Custom Made Comfort
Unlimited Body Activity

Single with Dummy Illustrated
Double not Illustrated

C. F. ANDERSON CO., INC.

901 Marquette
Minneapolis, Minnesota

Malpractice Prophylaxis

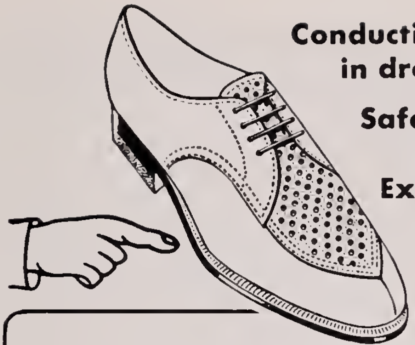
With us freedom from group involvements in insurance functions brings far less malpractice litigation than prevails elsewhere

Specialized Service makes our doctor safer

THE MEDICAL PROTECTIVE COMPANY
FORT WAYNE, INDIANA

Professional Protection Exclusively since 1899

MINNEAPOLIS Office:
Robert L. McFerran, Rep.
311 East 24th St., Apt. A-1
Telephone Federal 9-1292



Conductive Shoe in dress style

Safety from Fire and Explosion★

- Insole extension and wedge at inner corner of heel where support is most needed.
- The patented arch support construction is guaranteed not to break down.
- Innersoles guaranteed not to crack or collapse.
- Foot-so-Port lasts designed and the shoe construction engineered with orthopedic advice.

★ Conductive Shoes for surgical and operating room personnel. N.B.F.U. specifications.

- We are also the manufacturer of the Gear-Action Shoe designed by noted orthopedic surgeon.
- We make more shoes for polio, club feet and disabled feet than any other shoe manufacturer.

Send for free booklet, "The Preservation of the Function of the Foot Balancing and Synchronizing the Shoe with the Foot."

Write for details or contact your local **FOOT-SO-PORT** *Shoe Agency. Refer to your Classified Directory*

Foot-so-Port Shoe Company, Oconomowoc, Wis.
A Division of Musebeck Shoe Company

A MODERN PRIVATE SANITARIUM

for the Diagnosis, Care and Treatment of Nervous and Mental Disorders

MAIN BUILDING—One of 10 Units in "Cottage Plan"

ST. CROIXDALE ON LAKE ST. CROIX

PRESCOTT, WISCONSIN

Located on beautiful Lake St. Croix, 18 miles from the Twin Cities, it has the advantages of both City and Country. Every facility for treatment provided, including recreational activities and occupational-therapy under trained personnel. Close personal supervision given patients, and modern methods of therapy employed. Inspection and cooperation by reputable physicians invited. Rates very reasonable. Illustrated folder on request.

Prescott Office
Prescott, Wisconsin
Howard J. Laney, M.D.
Tel. 39 and Res., 76

Consulting Neuro-Psychiatrists
Hewitt B. Hannah, M.D., Andrew J. Leemhuis, M.D.
527 Medical Arts Bldg., Tel. FE. 2-1357, Minneapolis, Minn.

Superintendent
Ella M. Leseman
Prescott, Wisconsin
Tel. 69

Brown & Day, Inc.

PICKER CENTURY X-RAY UNIT

A New Model of the World's Most Popular 100 M.A. Machine

★

- NEW Anatomic Control
- NEW Smooth Appearance
- NO Technique Chart
- SAME Low Depreciation

★

See us for appraisal of your present unit

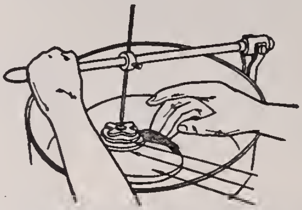
"Everything for the Physician"

for fast service call CA 2-1845

SERVICE BROWN & DAY INC. SAINT PAUL U.S.A. QUALITY

62-64 EAST 5TH ST
St. Paul 1, Minn.

UNUSUAL LENS GRINDING



CATARACT, MYO-THIN and other difficult and complicated lenses are ground to extreme thinness and accuracy by our expert workmen.

ARTHUR F. WILLIAMS

SAINT PAUL
MINNESOTA

ORTHOPEDIC APPLIANCES

Skill and care combine with quality materials in all Buchstein-Medcalf orthopedic appliances. Our workmanship and scientific design conform to the most exacting professional specifications. Accepted and appreciated by physicians and their patients for more than 45 years.

ARTIFICIAL LIMBS, TRUSSES
SUPPORTERS, ELASTIC HOSIERY

Prompt, painstaking service

Buchstein-Medcalf Co.

223 So. 6th St. Minneapolis 2, Minn.

RADIUM

(Including Radium Applicators)

FOR ALL MEDICAL PURPOSES

Est. 1919

Quincy X-Ray and Radium Laboratories

(Owned and Directed by a Physician-Radiologist)

HAROLD SWANBERG, B.S., M.D.
Director

W. C. U. Bldg. Quincy, Illinois

GYNECOLOGIC CYTOLOGY SERVICE

Interpretation of Cervico-Vaginal, Etc.
(Papanicolaou) Smears
for the
Diagnosis of Carcinoma

Kits (Slides, Spatulas, Fixative and Mailing Containers)
and
Instructions for Taking and Mailing Smears furnished on request

M. WM. RUBENSTEIN, M.D.
GYNE-CYTOLOGY LABORATORY
636 Church Street, Room 517 Evanston, Illinois

The Birches Sanitarium, Inc.

2391 Woodland Avenue
Duluth 3, Minnesota

A hospital for the care and treatment of Nervous and Mental disorders. Quiet, cheerful environment. Specially trained personnel. Recreational and occupational therapy.

Dr. L. R. Gowan, M.D., M.S., Medical Director

Cook County Graduate School of Medicine

INTENSIVE POSTGRADUATE COURSES
STARTING DATES—FALL, 1956

SURGERY—Surgical Technic, two weeks, October 29, November 26.
Surgery of Colon and Rectum, one week, October 15, November 26.
General Surgery, one week, October 29.
General Surgery, two weeks, November 5.
Breast and Thyroid Surgery, one week, October 22.
Gallbladder Surgery, three days, October 29.
Fractures and Traumatic Surgery, two weeks, October 15.

GYNECOLOGY & OBSTETRICS—Office and Operative Gynecology, two weeks, October 22.
Vaginal Approach to Pelvic Surgery, one week, October 15.
General and Surgical Obstetrics, two weeks, November 5.

MEDICINE—Electrocardiography and Heart Disease, two-week basic course, October 8.
Gastroenterology, two weeks, October 22.
Dermatology, two weeks, October 15.
Cardiology (Pediatric), two weeks, November 5.

RADIOLOGY—Diagnostic x-ray, two weeks, November 26.
Clinical Uses of Radioisotopes, two weeks, October 8.

UROLOGY—Two-week course, October 8.
Cystoscopy, ten days, by appointment.

TEACHING FACULTY—ATTENDING STAFF OF COOK COUNTY HOSPITAL

ADDRESS: REGISTRAR, 707 South Wood Street,
Chicago 12, Illinois

GLYCAMINE®

TABLETS

For Peptic Ulcers and Hyperacidity

Available All Drug Stores

Distributed by
DALCO PHARMACAL CO.
Minneapolis, Minnesota

RADIUM RENTAL SERVICE

4340 CEDARWOOD ROAD
MINNEAPOLIS 5, MINNESOTA
TEL. FE 3-5297

Radium element prepared in type of applicator requested

ORDER BY TELEPHONE OR MAIL
PRICES ON REQUEST

EVERY WOMAN WHO SUFFERS IN THE MENOPAUSE DESERVES "PREMARIN"®

widely used natural, oral estrogen

AYERST LABORATORIES
New York, N.Y. • Montreal, Canada
5646

Classified Advertising

Replies to advertisements with key numbers should be mailed in care of Minnesota Medicine *2642 University Avenue, Saint Paul 14, Minnesota.*

PHYSICIAN NEEDED—In county seat town of 1800, located in excellent farming community, Central Minnesota. No other physician within 35-mile radius. New 25-bed hospital planned. Good schools and housing. Office available. Address Kenneth Mattson, Mahnomen, Minnesota.

PHYSICIAN WANTED—Community of 4,000 needs physician and surgeon; resort area; new Clinic building just completed and future hospital assured; living quarters available. Write Secretary, Kelliher Hospital, Kelliher, Minnesota.

DOCTOR URGENTLY NEEDED in Le Center, Minnesota. Fully equipped new office, new home, available in beautiful, prosperous community 60 miles from Twin Cities. Previous man left to specialize. Call, write or see Miles Bowler, Mayor, Le Center, Minnesota.

WANTED—General practitioner for State Hospital. Salary range $641 to $781 per month. Quarters available, subsistence, laundry, and garage. Government working conditions, paid holidays, vacation, sick leave, and retirement pension plan. Write Superintendent, Fergus Falls State Hospital, Fergus Falls, Minnesota.

PHYSICIAN WANTED—Young, general practitioner interested in obstetrics and pediatrics, to join three-man suburban group in new building. Address E-543, care Minnesota Medicine.

LOCUM TENENS—Physician wanted until July, 1957, Northwestern Minnesota. Lucrative general and surgical practice. Equipped office near community hospital available on rental basis. Immediate income. Possible purchase or association later. Address E-544, care Minnesota Medicine.

WANTED—Christian doctor with surgical training and experience to associate with doctor in general practice in town of approximately 1,500 population and large rural territory; new up-to-date hospital. Write E-547, care Minnesota Medicine.

WANTED—College physician for Student Health Service at State College of Washington. Beginning salary, $10,000 annually. Three Student Health physicians are responsible for care of college student. Washington reciprocity with Alaska, Arizona, Arkansas, Colorado, Minnesota, Nevada, Oregon, South Dakota, Texas, and Wisconsin. Clinic hours are 9:00-12:00 and 1:00-5:00 p.m., weekdays and Saturday a.m. Write Harry B. Zion, M.D., Director, State College of Washington, Pullman, Washington.

POSITION WANTED—Nurse, with twelve years' experience as physician's office aide, x-raying, routine laboratory and bookkeeping, desires position in busy general practitioner's office, in rural area. References can be furnished. Address E-549, care Minnesota Medicine.

UNUSUAL OPPORTUNITY for young physician to join two-man group in southwestern Minnesota. Excellent starting salary; partnership after first year. New well-equipped, 22-bed hospital with offices in hospital. Adequate time off and time for postgraduate study. Excellent hunting and fishing. Training or interest in Pediatrics desirable, but not necessary. Address E-554, care Minnesota Medicine.

REGISTERED PHARMACIST—Wishes to open a pharmacy in clinic or hospital. Interested in partnership or pharmacy in its entirety. Address E-550, care Minnesota Medicine.

FOR SALE—Physician's office furniture and equipment, including desk, antique bookcase, ECG and diathermy. Address E-552, care Minnesota Medicine.

FOR SALE—Miscellaneous medical equipment, including 60 ma. Picker x-ray with new tube; Beck-Lee electrocardiograph in good condition (not direct writer); new Aloe diathermy. Also house-office combination with busy practice in lovely scenic area with all-weather paved roads near St. Cloud. Address E-553, care Minnesota Medicine.

FOR SALE—X-ray 100,000 Ma, white. Used very little. Also miscellaneous medical equipment. Address E-551, care Minnesota Medicine.

FOR RENT—Suite of seven rooms, especially designed for physician's use located at 2723 East 38th Street, Minneapolis. Occupied by M.D. past eleven years. Write or call H. A. Lindberg, 3925 28th Avenue South, Minneapolis 6, PArkway 2-0002.

FOR RENT—Highland Shopping Area, equipped office available, full or part time. Share with surgeon and dentist. Excellent for general practice, obstetrics, pediatrics. No equipment necessary; no rent until established. H. Schwyzer, M.D., 2069 Ford Parkway, Saint Paul. Telephone: MI 8-4832 or CA 4-7416.

ATTENTION DENTISTS AND DOCTORS—Modern space available for dentists' and doctors' offices. A location where several sets of doctors and dentists have been long established and then built their own clinics. A money maker. Above Kisch's Food Market. Plenty of auto parking space. Apply 637 Stryker Avenue, Saint Paul, Minnesota.

FOR RENT OR SALE—Eight-room, first-floor physician's office. Well equipped. Near Twin Cities. Gross over $30,000. New hospital—unlimited privileges. Good opportunity. Write E-511, care Minnesota Medicine.

DANIELSON MEDICAL ARTS PHARMACY, INC.

PHONES:
FEderal 3-3317
FEderal 3-3318

10-14 Arcade, Medical Arts Building
825 Nicollet Avenue—Two Entrances—78 South Ninth Street
MINNEAPOLIS

HOURS:
WEEK DAYS—8 to 7
SUN. & HOL.—10 to 1

Index to Advertisers

Abbott Laboratories ... A-4, A-5
Aloe, A. S., Co. ... A-49
American National Bank of St. Paul ... A-39
Ames Co., Inc. ... Cover III
Anderson, C. F., Co., Inc. ... A-50
Ayerst Laboratories ... A-53

Benson Optical Co. ... A-46
Birches Sanitarium, Inc. ... A-52
Brown & Day, Inc. ... A-52
Buchstein-Medcalf Co. ... A-52
Burroughs Wellcome & Co. ... A-22, A-42, A-43

Caswell-Ross Agency ... 660-A
Chicago Medical Society ... A-48
Ciba ... A-50
Classified Advertising ... A-54
Coca-Cola ... A-56
Cook County Graduate School of Medicine ... A-53
Corn Products Refining Co. ... A-14

Dalco Pharmacal Co. ... A-8, A-53
Danielson Medical Arts Pharmacy, Inc. ... A-55
Druggists Mutual Insurance Co. ... A-55

Foot-so-Port Shoe Co. ... A-51

Geigy Pharmaceuticals ... A-6
General Electric Co. ... A-32
Gyne-Cytology Laboratory ... A-52

Hoffmann-La Roche, Inc. ... Insert Facing A-16

Knox, Chas. B., Gelatine Co. ... A-7

Lakeside Laboratories ... A-27, A-48, A-50
Lederle Laboratories Div. ... A-9, 660-B, 660-C, A-41
Lilly, Eli, & Co. ... Cover I, A-36

Medical Protective Co. ... A-51
Merck, Sharp & Dohme ... A-10, A-11, A-45

Parke, Davis & Co. ... Cover II, A-1, A-20, A-21
Pfizer Laboratories, Div. of Chas. Pfizer & Co. ... A-12, A-13, A-31
Physicians Casualty & Health Associations ... A-44
Physicians & Hospitals Supply Co. ... A-38, A-39

Quincy X-Ray & Radium Laboratories ... A-52

Radium Rental Service ... A-53
Riker Laboratories ... A-23

St. Croixdale Sanitarium ... A-51
St. Paul Fire & Marine Insurance Co. ... A-49
Schering Corporation ... A-18, A-19, A-28, A-29, A-34, A-35
Searle, G. D., & Co. ... A-37
Smith, Kline & French Laboratories ... Cover IV
Squibb ... A-26
Sutliff & Case Co., Inc. ... A-46

Trautman, Ray, & Son ... A-56

Upjohn Co. ... A-16

Viceroy Cigarettes ... A-24

Wallace Laboratories ... A-25
Williams, Arthur F. ... A-52
Winthrop Laboratories ... A-30, A-48
Wyeth, Inc. ... A-15, A-17, A-33, A-47

Year Book Publishers, Inc. ... 660-D

Insurance at a Saving

Druggists' Mutual Insurance Company
OF IOWA, ALGONA, IOWA
Fire - Tornado - Automobile Insurance

Prompt Loss Service

MINNESOTA REPRESENTATIVE—S. E. STRUBLE, WYOMING, MINN.

Relax the best way
... pause for Coke

DRINK
Coca-Cola
Work
Refreshed
Coca-Cola

continuous quality
is quality you trust

DRINK
Coca-Cola
REG. U.S. PAT. OFF.

A Complete Orthopedic Fitting Service

PRESCRIPTION SERVICE BY CERTIFIED FITTERS AT
HOSPITAL—OFFICE—HOME

Camp Supports,
Identical Form Breasts,
Orthopedic Shoes,
Artificial Limbs,
Arms, Braces

For Men, Women and Children

ORTHOPEDIC APPLIANCE & LIMB MANUFACTURERS ASS'N. MEMBER

AMERICAN BOARD FOR CERTIFICATION CERTIFIED

RAY TRAUTMAN AND SON
410 Portland
FE 2-2339
Minneapolis 15, Minn.

quick YES or NO test

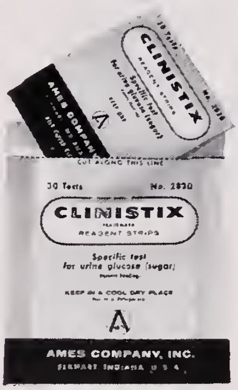
CLINISTIX®

BRAND Reagent Strips

specific enzyme test for urine glucose

60 Tests No. 2846
CLINISTIX
REAGENT STRIPS
Specific test for urine glucose (sugar)
KEEP IN A COOL DRY PLACE
DO NOT TOUCH TEST END OF STRIP
AMES COMPANY, INC.
ELKHART, INDIANA, U.S.A.

◀ routine office testing
bottles of 60 CLINISTIX Reagent Strips


CUT ALONG THIS LINE
30 Tests No. 2830
CLINISTIX
REAGENT STRIPS
Specific test for urine glucose (sugar)
KEEP IN A COOL DRY PLACE
AMES COMPANY, INC.
ELKHART, INDIANA, U.S.A.

daily check by mild diabetics, ▶
well-controlled diabetics
packets of 30 CLINISTIX Reagent Strips
in new protective foil pouch

utmost simplicity and convenience...A firm, easily handled CLINISTIX Reagent Strip is moistened with urine.

qualitative accuracy...CLINISTIX Reagent Strip turns blue only if glucose is present. No blue color—no glucose!

Ames Company, Inc • Elkhart, Indiana • Ames Company of Canada, Ltd., Toronto 18256

'Thorazine' relieved this patient's anxiety, tension and fear and made it possible for him to return to work.

'THORAZINE' CASE REPORT

patient: Anxiety, tension, and a fear of going out alone made it impossible for this 36-year-old man to work. After other treatments had failed he was given 'Thorazine'.

response: "On 'Thorazine' medication, 100 mg. orally, daily, his anxiety and apprehension disappeared rapidly. The patient was able to go out alone and to work once again. His mood was actually gay and his co-workers were surprised at this change. He was now free from care whereas before he had been distressed by the slightest difficulty."

This case report is from the files of a general practitioner.

THORAZINE*

Available in ampuls, tablets and syrup (as the hydrochloride), and in suppositories (as the base).

Smith, Kline & French Laboratories, Philadelphia

'Thorazine' should be administered discriminately and, before prescribing, the physician should be fully conversant with the available literature.

*T.M. Reg. U.S. Pat. Off. for chlorpromazine, S.K.F.

COLLEGE OF PHYSICIANS
LIBRARY
DEC 11 1956
OF PHILADELPHIA

Minnesota MEDICINE

Published Monthly by the Minnesota State Medical Association

Volume 39 NOVEMBER, 1956 Number 11

Printed in U.S.A. (Table of Contents—Pages A-2 and A-3) 40c a copy—$3.00 a year

Makes your therapy safe and pleasant as well as effective

ILOTYCIN

(Erythromycin, Lilly)

successfully attacks the pathogens you commonly encounter but avoids serious and disturbing side-effects.

Lilly

QUALITY / RESEARCH / INTEGRITY

Tablets, pediatric suspensions, drops, I.M. and I.V. ampoules.

632113

you can count on cooperation when you u

When you prescribe SUSPENSION CHLOROMYCETIN PALMITATE for sick youngsters, no tears or tantrums at medicine time threaten your dosage schedule. Children readily accept this tempting, custard-flavored preparation of CHLOROMYCETIN (chloramphenicol, Parke-Davis). Succeeding doses are taken as readily as the first, because SUSPENSION CHLOROMYCETIN PALMITATE is easy to swallow and leaves no unpleasant aftertaste.

To simplify therapy still further, SUSPENSION CHLOROMYCETIN PALMITATE does not require refrigeration and may be kept conveniently in the sickroom. Its liquid form enables flexibility of dosage easily.

CHLOROMYCETIN is a potent therapeutic agent and, because certain blood dyscrasias have been associated with its administration, it should not be used indiscriminately or for minor infections. Furthermore, as with certain other drugs, adequate blood studies should be made when the patient requires prolonged or intermittent therapy.

uspension

Chloromycetin®

Palmitate

pleasant-tasting Chloromycetin for pediatric use

Supplied: SUSPENSION CHLOROMYCETIN PALMITATE, containing the equivalent of 125 mg. of CHLOROMYCETIN per 4 cc., is available in 60-cc. vials.

SUSPENSION
CHLOROMYCETIN
PALMITATE

MEDICAMENTA · VERA

PARKE, DAVIS & COMPANY DETROIT 32, MICHIGAN

50030

Volume 39
Number 11

Minnesota

Contents fo

SCIENTIFIC ARTICLES

ORIGINAL CONTRIBUTIONS

The Role of Surgery in the Treatment of Arteriosclerosis of the Major Vessels
Thomas O. Murphy, M.D., John J. Haglin, M.D., C. Walton Lillehei, M.D., and *Richard L. Varco, M.D.,* Minneapolis, Minnesota 703

Leiomyosarcoma of the Small Bowel
Lawrence M. Larson, M.D., and *John H. Rosenow, M.D.,* Minneapolis. Minnesota 710

The Clinical Problem of Syphilis Today
Harold O. Perry, M.D., Robert R. Kierland, M.D., and *Thomas B. Magath, Ph.D., M.D.,* Rochester, Minnesota 717

Testicular Tumor—Metastatic from Hypernephroma
Joseph E. Twidwell, M.D., and *George L. Garske, M.D.,* Minneapolis, Minnesota 723

Rupture of Muscles and Tendons
Alan D. Weiner, M.D., and *Paul R. Lipscomb, M.D.,* Rochester, Minnesota 731

Importance of the Diagnosis of Glaucoma
P. J. Leinfelder, M.D., Iowa City, Iowa. and *Frederick M. Owens, Jr., M.D.,* Saint Paul, Minnesota 737

CASE PRESENTATION

Chlorpromazine Therapy Complicated by Agranulocytosis and Jaundice
Robert P. Jeub, M.D., Minneapolis, Minnesota, and *Leonard J. Michienzi, M.D.,* Saint Paul, Minnesota

SEMINAR

Reactions to Penicillin. III. Reactions During 1952
William E. Wellman, M.D., and Donald J. Corr, M.D., Rochester, Minnesota ....

CURRENT CONCEPTS

Functional Manifestations in Organic Cardiovascular Disease
Geoffrey Bourne, London, England........

CONTINUATION STUDIES

The Genesis of Intestinal Atresia
C. N. Barnard, M.D., Minneapolis, Minnesota, and *J. H. Louw, Ch.M.,* Cape Town, South Africa...

CANCER DETECTION

Minnesota Doctors are Beginning to Detect Occult Cancer
The Cancer Committee, MSMA........

Official Journal of

Duluth Surgical Society
Minneapolis Academy of Medicine
Minneapolis Obstetrical and Gynecological Society
Minneapolis Surgical Society
Minnesota Academy of Medicine
Minnesota Obstetric and Gynecologic Society

GENER

Owner and Publisher

Published by MINNESOTA STATE MEDICAL ASSOCIATION
496 Lowry Medical Arts Building
St. Paul 2, Minnesota

Editing and Publishing Committee

E. M. Hammes, M.D.
Chairman, Saint Paul

F. M. Owens, Jr., M.D.
Saint Paul

T. A. Peppard, M.D.
Minneapolis

Henry Ulrich, M.D.
Minneapolis

Business Manager

R. R. Rosell
496 Lowry Medical Arts Building
St. Paul 2, Minnesota

Authors

Manuscripts should be addressed to Arthur H. Wells, M.D., Editor, 915 East F Street, Duluth 5, Minnesota. Telephone RA 7-6636 or JA 5-2319. Original papers prepa for publication solely in Minnesota Medicine will be considered by the Board of Edit providing they fulfill the following editorial standards. Manuscripts should be ty double spaced on white paper with at least 1-inch margins. The original (not a carb copy) is requested. The title on the first page should be under six words if possi or divided into two parts. The author should give his highest degree, his institutio position or his relationship to a hospital or medical organization which he may addressing. Pages should be numbered consecutively and the author's last name sho appear at the top of each page after the first page.

Biographical references should appear on a separate sheet entitled "Bibliography." Th should appear and be numbered consecutively in the order in which they first occur the text (not alphabetically). Citations in the text require reference numbers if author's or authors' names are not used or if there is more than one reference to same author or group of authors. All references to author should appear in Bibliography and no references should be included which are not in the text. The st and exact punctuation used in the J.A.M.A. references is requested. For a journal this *Author's last name, initial, initial.: title of paper. Abbreviated name of journal, volu number: page, year.* Book references should give author, title. edition number, ci publisher and year.

Illustrations (photographs, tables and graphs) should be submitted separately and r combined in the text. There should be a separate sheet entitled "Illustrations" whi contains the various types of illustrations listed separately and numbered in the orc

Medicine

November, 1956

Volume 39
Number 11

MISCELLANEOUS ARTICLES

DITORIALS

Insulin Reactions 747
The Medical Student Committee 747
The Minnesota Human Genetics League 748
The Need for Hospitals and Related Facilities in Minnesota 749
Rehabilitation in Pulmonary Tuberculosis 749
American Academy of Occupational Medicine 750
Telephone Service 751
Inside Looking Out 751
The Architect's Role 752

RESIDENT'S LETTER

Continued Support for American Medical Education Foundation 754

MEDICAL ECONOMICS

New Poll Reveals Physicians' Opinions on Social Security 755
What Americans Spend for Medical Care 756
Legislation Outlawing Dangerous Chemicals Proposed 756
New Surgeon General 756
Leaders Predict Future of Medical Practice 756
Federal Grants for Medical Research 757
Supreme Court to Review Numerous Medical Cases 757

MEETINGS AND ANNOUNCEMENTS 758

WOMAN'S AUXILIARY 759

IN MEMORIAM 760

GENERAL INTEREST

Personal Items A-40
New Locations A-44
Minnesota Blue Cross-Blue Shield A-44

COMMUNICATIONS A-45

Minnesota Society of Clinical Pathologists
Minnesota Society of Internal Medicine
Minnesota Society of Neurology and Psychiatry
Minnesota State Medical Association
Minnesota Surgical Society
Northern Minnesota Medical Association
Saint Paul Surgical Society
Southern Minnesota Medical Association

NFORMATION

which they appear in the text. All photographs must be in black and white, clear t, contrasting, and on glossy prints. Instructions for combining photographs are ceptable. Any number of illustrations over 4 are charged to the author. Combinations photographs up to one-half page (6 x 4⅜ inches) count as 1 illustration.

eaders and Reviewers

The right is reserved to reject material submitted for reading or advertising columns. he views expressed in this journal do not necessarily represent those of the Minnesota ate Medical Association or any of its constituents.

dvertisers and Subscribers

Classified advertising—10 cents a word; minimum charge $2.00; key number, 25c ditional. Remittance should accompany order. Display advertising rates on request.

Annual Subscription—$3.00. Single Copies—$0.40. Foreign and Canadian—$3.50.

Communications concerning advertising and subscriptions should be addressed to INNESOTA MEDICINE, 2642 University Avenue, Saint Paul 14, Minnesota. Telephone Mid- ay 6-2641.

opyright and Post Office Entry

Contents of MINNESOTA MEDICINE ©1956 by Minnesota State Medical Association.

Entered at the Post Office in Saint Paul as second class matter. Accepted for mailing at e special rate of postage provided for in Section 1103, Act of October 3, 1917, thorized July 13, 1918.

Board of Editors

ARTHUR H. WELLS, M.D.
Editor-in-Chief, Duluth

STUART W. ARHELGER, M.D.
Minneapolis

JOHN F. BRIGGS, M.D.
Saint Paul

S. FRANCIS CEPLECHA, M.D.
Redwood Falls

TAGUE C. CHISHOLM, M.D.
Minneapolis

ROBERT B. HOWARD, M.D.
Minneapolis

R. DREW MILLER, M.D.
Rochester

HENRY G. MOEHRING, M.D.
Duluth

GLENN J. MOURITSEN, M.D.
Fergus Falls

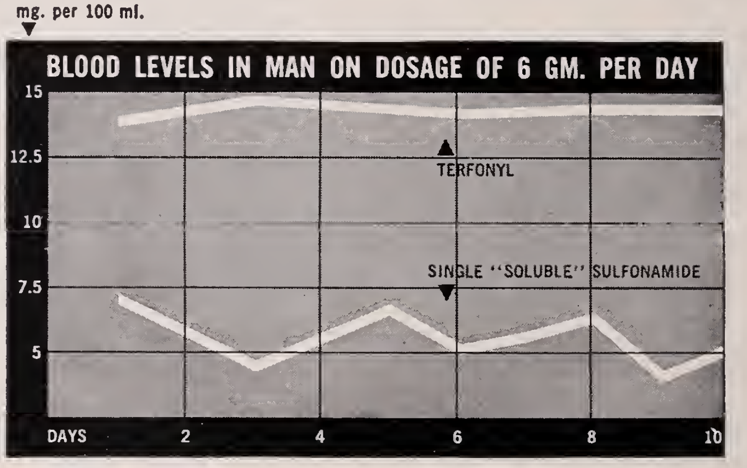
OLIVE V. SEIBERT, B.A.
Saint Paul

GEORGE STILWELL, M.D
Rochester

maximum efficacy with minimum risk

Terfonyl

SQUIBB METH-DIA-MER SULFONAMIDES



– After Lehr, D., Modern Med. 23:111 (Jan. 15) 1955.

Terfonyl is absorbed as well as single "soluble" sulfonamides, but is eliminated at a slower rate. For this reason, Terfonyl blood levels are much higher.

In experimental infections (Klebsiella, Pneumococcus, Streptococcus), Meth-Dia-Mer sulfonamides have been shown to be from three to four times more effective on a weight basis than single "soluble" sulfonamides.

Toxicity is minimal because normal dosage provides only one-third the normal amount of each sulfonamide. The body handles each component as though it were present alone, although therapeutic effects are additive.

Terfonyl Tablets, 0.5 Gm., bottles of 100 and 1000.
Terfonyl Suspension, 0.5 Gm. per 5 ml., pint bottles.

0.167 Gm. each of sulfamethazine, sulfadiazine and sulfamerazine per tablet or per 5 ml. teaspoonful of suspension.

SQUIBB

TERFONYL® IS A SQUIBB TRADEMARK

Lysine plus vitamins

to help children eat more,

grow more!

INCREMIN combines the amino acid lysine with vitamins B_1, B_6 and B_{12}—essential nutrients that stimulate appetite, and promote more efficient utilization of protein. For children who are problem eaters, for the underweight, for the generally below-normal child—INCREMIN will usually produce a remarkable and prompt improvement!

Cherry flavor. Can be mixed with milk, milk formula, or other liquid. In 15 cc. polyethylene dropper bottle.

Dosage: 0.5 to 1 cc. (10-20 drops) daily. Each cc. (20 drops) contains:

l-Lysine HCl	300 mg.
Vitamin B_{12}	25 mcgm.
Thiamine HCl (B_1)	10 mg.
Pyridoxine HCl (B_6)	5 mg.
Alcohol	1%

Excellent for the elderly! INCREMIN serves equally well to stimulate lagging appetites in geriatric patients.

New

INCREMIN*

Lysine-Vitamin Drops

Lederle LEDERLE LABORATORIES DIVISION, AMERICAN CYANAMID COMPANY, PEARL RIVER, NEW YORK

*REG. U.S. PAT. OFF.

recognized

as a potent, specific anti-arthritic

established

by over 100 million patient days

substantiated

in more than 700 published reports

BUTAZOLIDIN®

(phenylbutazone GEIGY)

potent, specific anti-arthritic

Based on an impressive background of achievement attained over a period of four years involving both long-term and short-term therapy in all the major forms of arthritis, BUTAZOLIDIN is recognized as one of the most effective anti-arthritic agents currently available.

relieves pain

improves function

resolves inflammation

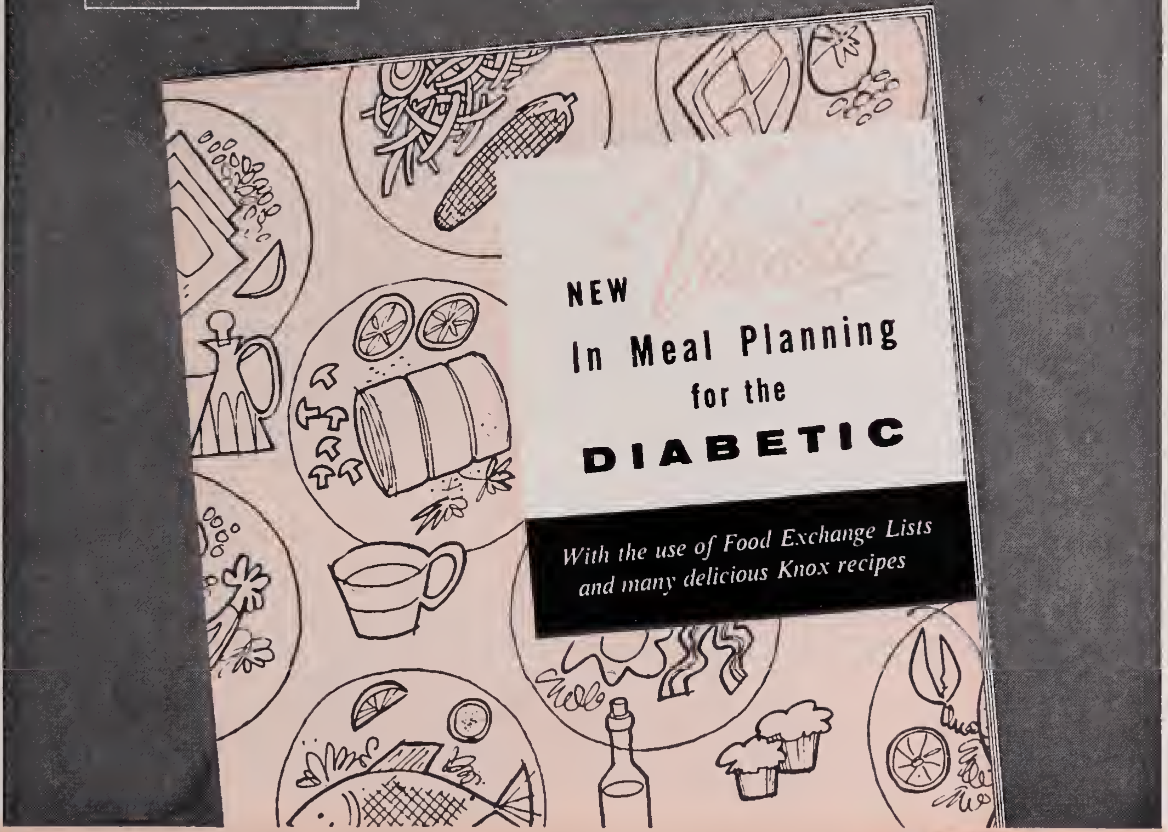
BUTAZOLIDIN being a potent therapeutic agent, physicians unfamiliar with its use are urged to send for literature before prescribing it.

GEIGY

Geigy GEIGY PHARMACEUTICALS, Division of Geigy Chemical Corporation, New York 13, N. Y.

72556

KNOX Protein Previews


NEW
In Meal Planning
for the
DIABETIC
With the use of Food Exchange Lists
and many delicious Knox recipes

Newest Knox Brochure
Aids Dietary Management of Diabetics

KNOX
32
GELATINE

Although more than 50% of diabetics can be managed with proper diet, continued success is dependent upon proper motivation of patients. Determination to abide by dietary restrictions is also important for the diabetic being managed with insulin.

The new Knox booklet "New Variety in Meal Planning" has been prepared to help the physician enlist the patient's enthusiasm for dietary measures and to help maintain this enthusiasm. It explains the importance of diet to the diabetic, shows him how to use the newest dietary advance —Food Exchange Lists[1]—and then describes how to provide tasty variety with 14 pages of tested, diabetic recipes.

"New Variety in Meal Planning" makes no attempt to prescribe a system of treatment. It shows how the recipes described may be used to good advantage in practically any system of diabetic management. If you would like a supply for your practice, use coupon below.

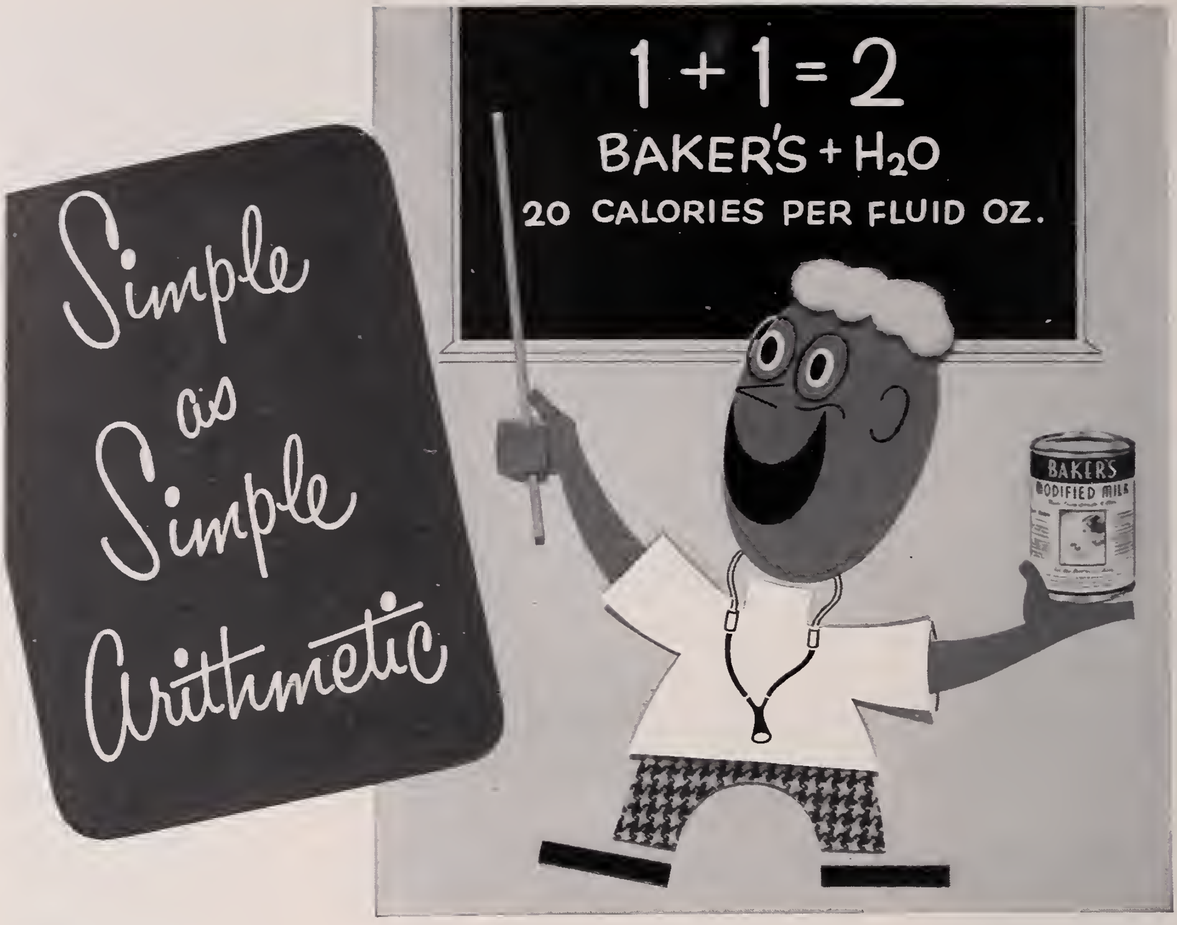
---

[1] Developed by the U. S. Public Health Service assisted by committees of The American Diabetic Association, Inc. and The American Dietetic Association.

Knox Gelatine Company
Professional Service Department SJ-20
Johnstown, N. Y.

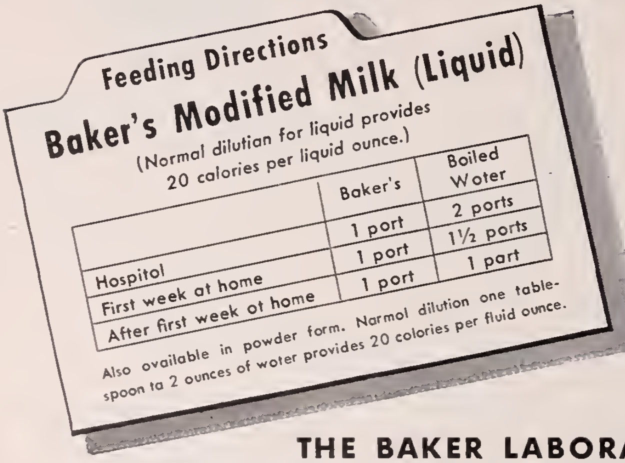
Please send me........copies of the new Knox diabetic brochure describing the use of Food Exchange Lists.

YOUR NAME AND ADDRESS



With little chance of error in Formula Preparation

BAKER'S MODIFIED MILK*



Feeding Directions

Baker's Modified Milk (Liquid)

(Normal dilution for liquid provides 20 calories per liquid ounce.)

	Baker's	Boiled Water
Hospital	1 part	2 parts
First week at home	1 part	1½ parts
After first week at home	1 part	1 part

Also available in powder form. Normal dilution one tablespoon to 2 ounces of water provides 20 calories per fluid ounce.

Designed for all infant feeding from birth to the end of the first year, Baker's Modified Milk is a time-saver for busy physicians and busy hospitals.

Baker's Modified Milk is furnished gratis to all hospitals for your use.

*Made exclusively from Grade A milk (U. S. Public Health Service Milk Code) which has been modified by replacement of the milk fat with vegetable and animal fats and by the addition of carbohydrates, vitamins and iron.

THE BAKER LABORATORIES, INC.

Milk Products Exclusively for the Medical Profession

MAIN OFFICE: CLEVELAND 3, OHIO • PLANT: EAST TROY, WISCONSIN

relaxes both
the body
and the
mind

well suited for prolonged therapy

- well tolerated, nonaddictive, essentially nontoxic
- no blood dyscrasias, liver toxicity, Parkinson-like syndrome or nasal stuffiness
- chemically unrelated to chlorpromazine or reserpine
- does not produce significant depression
- orally effective within 30 minutes for a period of 6 hours

Indications: **anxiety and tension states, muscle spasm.**

THE ORIGINAL MEPROBAMATE

Miltown®

Tranquilizer with muscle-relaxant action

DISCOVERED AND INTRODUCED
BY WALLACE LABORATORIES, *New Brunswick, N.J.*

2-methyl-2-n-propyl-1,3-propanediol dicarbamate—U.S. Patent 2,724,720

SUPPLIED: *400 mg. scored tablets. Usual dose: 1 or 2 tablets t.i.d.*

Literature and Samples Available on Request

THE MILTOWN MOLECULE

CM 3706

ANNOUNCING

CATH

more effective

in clinica

important infectio

than any other

antibiotic

FOR MOST INFECTIONS

CILLIN

NEW

(NOVOBIOCIN-PENICILLIN G, MERCK)

THE ANTIBIOTIC PRODUCT
MOST LIKELY TO BE EFFECTIVE

OMPARE THESE ADVANTAGES:

. Proved effectiveness in the largest num-
er of clinically important infections in-
uding those caused by antibiotic-resistant
aphylococci and proteus.

. Therapeutic, *bactericidal* blood levels are
romptly achieved.

. Exceptionally well tolerated; patient sen-
tivity reactions are rare at recommended
osage.

. No yeast or fungal super-infections nor
ny antibiotic-induced enteritis, vaginitis or
roctitis have been reported following
ATHOCILLIN.

. No problems of cross-resistance have been
ncountered with CATHOCILLIN.

. The normal intestinal flora is not dis-
urbed by CATHOCILLIN.

OSAGE: *for adults—two capsules q.i.d.; for children*
nder 100 lbs.—dosage in proportion to weight (e.g. one
apsule q.i.d. for a child weighing 50 lbs.).

CONSIDER CATHOCILLIN FIRST

—for these clinically important infections: tonsillitis; pharyngitis; pneumonia; otitis media; cervical lymphadenitis; streptococcal sore throat; infected tooth sockets; Vincent's infection; acne and superficial skin infections; impetigo; boils, furuncles and carbuncles; lung abscess; bronchitis; mastitis; osteomyelitis; wound infections; postoperative wound infections and infected lacerations; staphylococcal enteritis, staphylococcal diarrhea of the newborn; peritonitis (caused by susceptible organisms); pelvic inflammatory disease; gonorrhea; gonococcal arthritis; urethritis; scarlet fever; erysipelas.

SUPPLIED: *Blue and white capsules of* 'CATHOCILLIN' *—each containing 125 mg. of* 'CATHOMYCIN' *(as Sodium Novobiocin, Merck) and 75 mg. (125,000 units) Potassium Penicillin G; bottles of 16.*

'n one prescription the one antibiotic product most likely to be effective

MSD

MERCK SHARP & DOHME

DIVISION OF MERCK & CO., INC., PHILADELPHIA 1, PA.

NEW

At

Ataraxoid is a unique, new combination of Sterane and Atarax, which now permits simultaneous symptomatic control and reduction of attendant anxiety and apprehension in rheumatoid arthritis and other indications.

The added tranquilizer control, desirably easing mental stress, also directly assists clinical progress. It minimizes the chance of exacerbation related to emotional strain and facilitates patient confidence and coöperation in the therapeutic program toward maximum rehabilitation.

Ataraxoid exerts the anti-rheumatic, anti-inflammatory activity of Sterane distinctly superior to previous steroids, effective in radically reduced dosage, and with minimal disturbance of electrolyte and fluid metabolism.

The ataractic effect is a central neuro-relaxing action – the result of a marked cerebral specificity – free of mental fogging and devoid of any major complications: no liver, blood or brain damage. This peace-of-mind component is also used in the lowest dosage range.

Supplied: Each green, scored, Ataraxoid oral tablet contains 5 mg. prednisolone (Sterane) and 10 mg. hydroxyzine hydrochloride (Atarax). Bottles of 30 and 100.

PFIZER LABORATORIES
Division, Chas. Pfizer & Co., Inc.
Brooklyn 6, New York

the first
and only
ataraxic-corticoid

araxoid*

prednisolone and hydroxyzine

Pfizer

combining the newest, safest tranquilizer, ATARAX® + the newest, most effective steroid, STERANE® (prednisolone)

simultaneously controls
the symptoms and the
apprehension

**In Rheumatoid Arthritis,
other collagen diseases,
bronchial asthma and
inflammatory dermatoses**

*Trademark

highly successful .

- faster relief of pain, photophobia
- better control of inflammation, edema, allergy
- effective against common eye pathogens
- extremely well tolerated

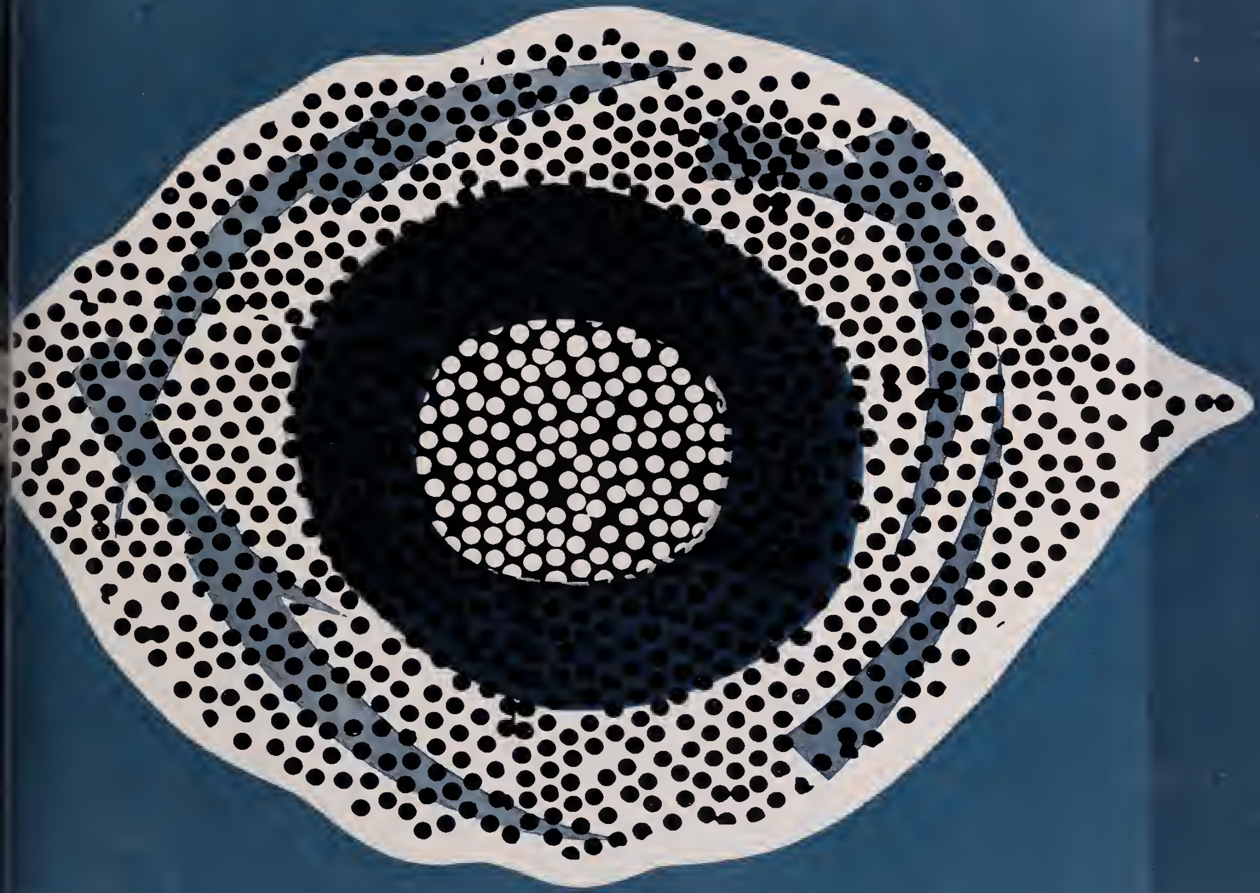
now available

for inflammatory, allergic, infectious or traumati
eye conditions amenable to topical therapy—rapid
potent, topical Meti-steroid and anti-infective actio

supplied: METIMYD Ophthalmic Suspension-*Sterile*: prednisolone acet
(METICORTELONE Acetate) 5 mg. per cc. (0.5%) suspended in an isoto
buffered and preserved solution of sulfacetamide sodium 100 mg. per c
(10%), 5 cc. dropper bottle. METIMYD Ointment with Neomycin: each gr
contains 5 mg. prednisolone acetate (METICORTELONE Acetate), 100 m
sulfacetamide sodium and 2.5 mg. neomycin sulfate (equivalent to 1.75 m
neomycin base); ⅛ oz. tube, boxes of 1 and 12.

METIMYD,* brand of prednisolone acetate and sulfacetamide sodium.
METICORTELONE,® brand of prednisolone.
*T.M.

. in topical eye therapy



new

METIMYD*

(prednisolone acetate and sulfacetamide sodium)

Ophthalmic Suspension-Sterile

and

METIMYD

(prednisolone acetate and sulfacetamide sodium with neomycin sulfate)

Ointment with Neomycin

antibacterial • antiallergic • anti-inflammatory

Schering

How to win *little* friends ...

CHILDREN'S SIZE BAYER ASPIRIN 48 TABLETS 25¢
FLAVORED
Children's Size
BAYER
ASPIRIN
BAYER
REG. U.S. PAT. OFF.
Genuine
48 TABLETS
25¢
1¼ GRS. EA.
DR.
℞

The Best Tasting
Aspirin you can prescribe.

The Flavor Remains Stable
down to the last tablet.

25¢ Bottle of 48 tablets (1¼ grs. each).

We will be pleased to send samples on request.

THE BAYER COMPANY DIVISION
of Sterling Drug Inc.
1450 Broadway, New York 18, N. Y.

Only two doses a day for round-the-clock antibacterial therapy

In most cases, you can now provide antibacterial treatment around the clock with only two doses of Lipo Gantrisin daily. By producing adequate twelve-hour blood levels, Lipo Gantrisin 'Roche' simplifies the treatment of children and chronic invalids. This palatable liquid provides all the therapeutic advantages of Gantrisin on a b.i.d. schedule.

Lipo Gantrisin® Acetyl—brand of acetyl sulfisoxazole in vegetable oil emulsion

For patients pursued by their own emotions —

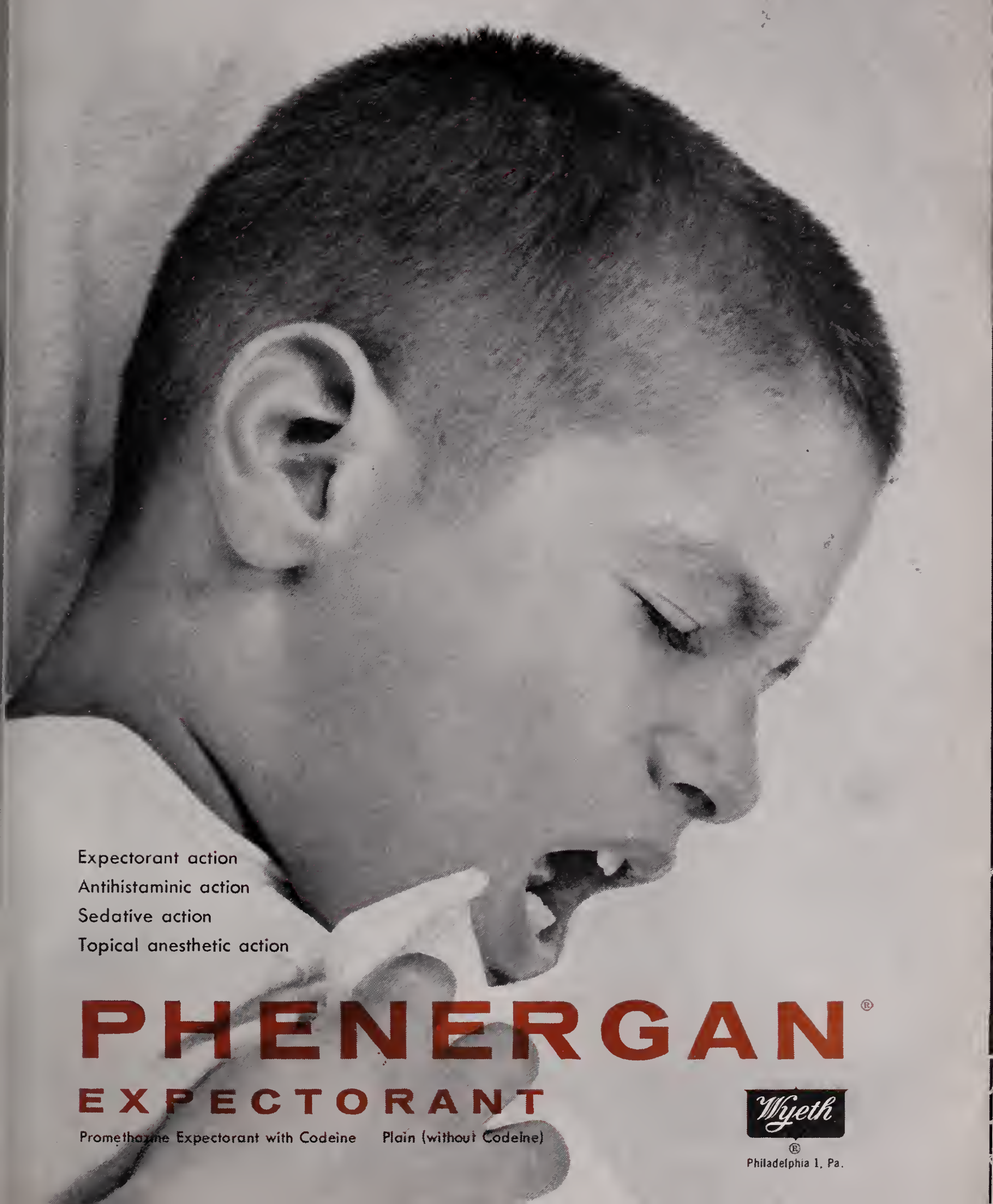
Noludar 'Roche' will help solve the problem. Not a barbiturate, not likely to be habit forming, 50 mg t.i.d. provides daytime sedation with little likelihood of somnolence, while 200 mg h.s. induces a sound night's sleep, usually without hangover. Noludar tablets, 50 and 200 mg; elixir, 50 mg per teaspoon.

Hoffmann - La Roche Inc
Nutley 10, New Jersey

Noludar®--
brand of methyprylon

to quiet the cough

and calm the patient . . .



Expectorant action
Antihistaminic action
Sedative action
Topical anesthetic action

PHENERGAN®

EXPECTORANT

Promethazine Expectorant with Codeine   Plain (without Codeine)

Wyeth®
Philadelphia 1, Pa.

Meat...

Good Nutrition and Endocrine Functioning

Maintenance of homeostasis attuned to health devolves upon good nutrition and normal functioning of the enzyme and endocrine systems.[1,2,3] Conversely, by impairing vital activities of the endocrines, poor nutrition can seriously disturb production of hormones needed to regulate metabolic processes.

Intense and prolonged deficiency in essential nutrients and food energy depresses pituitary, gonadal, and other endocrine activity, leading to subnormal physiologic states. Clinical studies exposing male volunteer subjects to a semistarvation diet produced symptoms resembling those of various endocrine dysfunctions.[4] Since the pituitary and other hormones are protein in nature, it appears logical to assume that protein nutrition plays an important part in their synthesis.[5]

Meat, by supplying valuable amounts of high quality protein, B vitamins, essential minerals, and fat containing unsaturated fatty acids, contributes importantly to any role that good nutrition may play in the maintenance of the endocrines, their functioning, and the production of hormones.

---

1. Ralli, E. P., and Dumm, M. E.: The Hormonal Control of Metabolism, in Wohl, M. G.: Modern Nutrition in Health and Disease, Philadelphia, Lea and Febiger, 1955, pp. 57-74.
2. McHenry, E. W.: Nutrition and Endocrine Function, Borden's Review of Nutrition Research, *16*:17 (Mar.-Apr.) 1955.
3. Ershoff, B. H.: Conditioning Factors in Nutritional Disease, Physiol. Rev. *28*:107 (Jan.) 1948.
4. Keys, A.; Brozek, J.; Henschel, A.; Mickelsen, O., and Taylor, H. L.: The Biology of Human Starvation, Minneapolis, University of Minnesota Press, 1950.
5. Samuels, L. T.: Progress in Clinical Endocrinology, New York, Grune and Stratton, 1950, p. 509.

The nutritional statements made in this advertisement have been reviewed by the Council on Foods and Nutrition of the American Medical Association and found consistent with current authoritative medical opinion.

American Meat Institute
Main Office, Chicago . . . Members Throughout the United States

Sodium Restriction

A. Indications

1. Congestive heart failure
2. Hypertension
3 Cirrhosis
4. Pregnancy edema
5. Obesity

B. Management

1. Salt Free Diet
2. Salt Substitutes

Rx

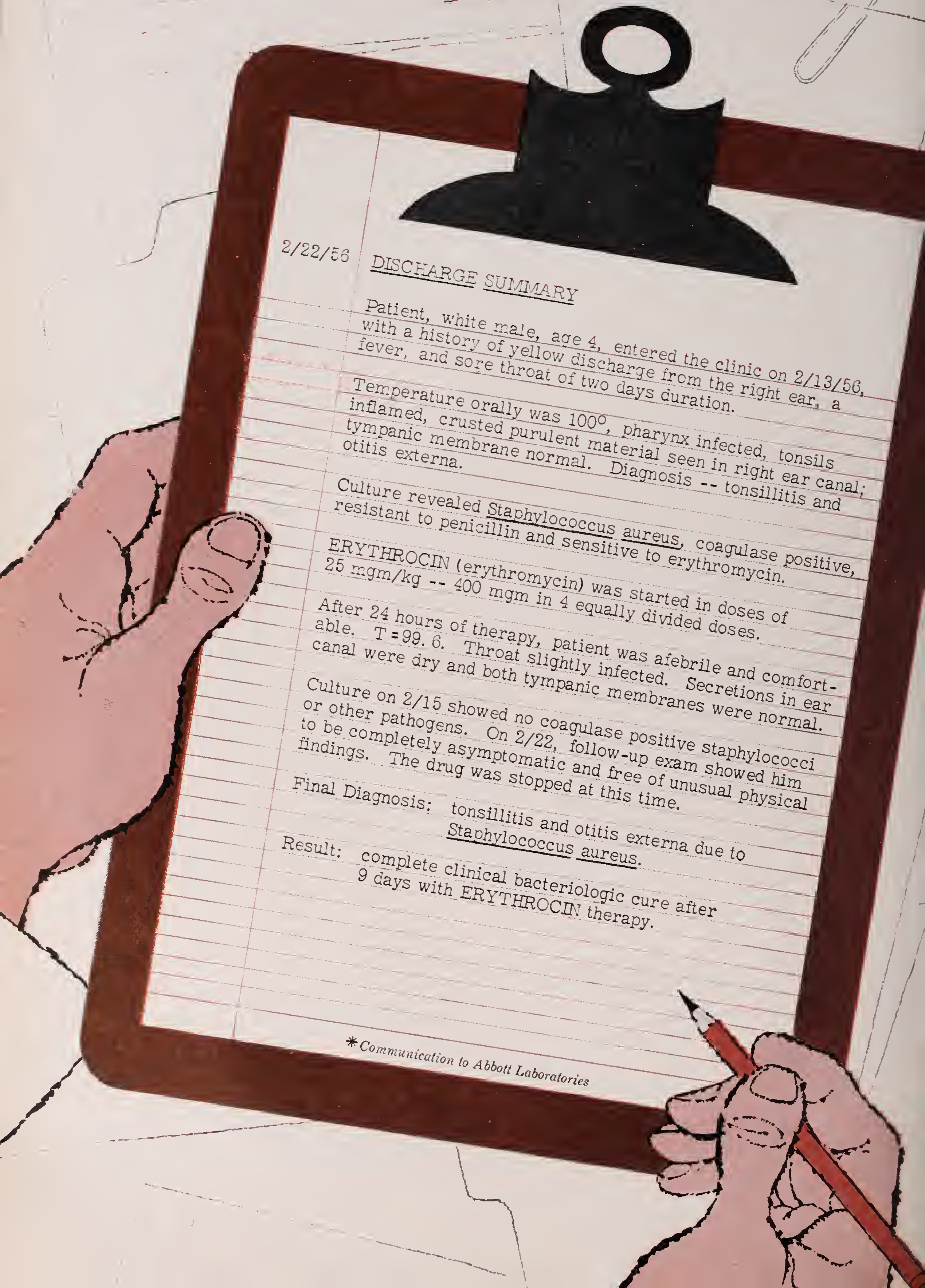
Neocurtasal

New improved formula - now the best tasting. Used like table salt.

Winthrop

eocurtasal ®
oz. Shakers + 8 oz. bottles

Erythrocin in treating tonsillitis and otitis extern



2/22/56 DISCHARGE SUMMARY

Patient, white male, age 4, entered the clinic on 2/13/56, with a history of yellow discharge from the right ear, a fever, and sore throat of two days duration.

Temperature orally was 100°, pharynx infected, tonsils inflamed, crusted purulent material seen in right ear canal; tympanic membrane normal. Diagnosis -- tonsillitis and otitis externa.

Culture revealed Staphylococcus aureus, coagulase positive, resistant to penicillin and sensitive to erythromycin.

ERYTHROCIN (erythromycin) was started in doses of 25 mgm/kg -- 400 mgm in 4 equally divided doses.

After 24 hours of therapy, patient was afebrile and comfortable. T = 99.6. Throat slightly infected. Secretions in ear canal were dry and both tympanic membranes were normal.

Culture on 2/15 showed no coagulase positive staphylococci or other pathogens. On 2/22, follow-up exam showed him to be completely asymptomatic and free of unusual physical findings. The drug was stopped at this time.

Final Diagnosis: tonsillitis and otitis externa due to Staphylococcus aureus.

Result: complete clinical bacteriologic cure after 9 days with ERYTHROCIN therapy.

* *Communication to Abbott Laboratories*

"clinical response good or excellent"

In one recent study, 18 patients with acute follicular tonsillitis and septic sore throat, were given erythromycin. Infecting organism was *Str. pyogenes*. The investigator stated, "*In all 18, the clinical response could be regarded as either good or excellent.*"[1]

This, of course, is only one of many reports showing the effectiveness of ERYTHROCIN against coccic infections. You'll get the same good results (nearly 100% in common, bacterial respiratory infections) when your prescription reads *Filmtab* ERYTHROCIN Stearate.

"toxicity lower in erythromycin-treated patients"

After a study of 208 patients treated with erythromycin (78), procaine penicillin (78) and a placebo (52), the investigator stated: ". . . *the incidence of toxicity* (compared to procaine penicillin) *was significantly lower in the erythromycin-treated patients.*"[1]

Actually, ERYTHROCIN stands on a remarkable record of safety. After four years, there's not a single report of a severe or fatal reaction attributable to erythromycin. Also, allergic reactions rarely occur. *Filmtab* ERYTHROCIN Stearate (100 and 250 mg.), is available in bottles of 25 and 100, at all pharmacies.

Abbott

® Filmtab—Film sealed tablets, Abbott; pat. applied for.

1. Herrell, W. E., Erythromycin, Antibiotics Monographs, No. 1, p. 29, New York, Medical Encyclopedia, Inc., 1955.
Idem p. 30.

Erythrocin® STEARATE

(Erythromycin Stearate, Abbott)

KARO® SYRUP . . . meets the need for a highly potent source of infant carbohydrate

The need for carbohydrate, particularly during the rapid growth period of early infancy, is well recognized. One highly effective means of assuring adequate carbohydrate is by the addition of Karo syrup to the milk formula.

Karo—a balanced mixture of dextrins, maltose and dextrose—enables the feeding of larger amounts of total carbohydrate than is possible with a single sugar such as lactose or sucrose. Karo is double rich in calories and, more importantly, it is easily digested, completely utilized and well-tolerated; even by prematures and newborns.

From the standpoint of the physician, Karo permits easy adjustment of formula and safe transition from liquid to solid food. Mothers appreciate the ease of making formulas with Karo, plus its ready availability and economy. Light or dark Karo syrup may be used interchangeably since each yields 120 calories per ounce (2 tablespoons).

Karo
SYRUP
CRYSTAL WHITE

1906 • 50th ANNIVERSARY • 1956
CORN PRODUCTS REFINING COMPANY
17 Battery Place, New York 4, N. Y.

Brings
new certainty to
antibiotic therapy
particularly for the
90% of patients
treated in home
or office

new

Sigmamycin*

OLEANDOMYCIN TETRACYCLINE

*TRADEMARK

a new maximum
in therapeutic
effectiveness

a new maximum
in protection
against
resistance

a new maximum
in safety and
toleration

multi-spectrum
synergistically
strengthened…

Sigma

OLEANDOMYCIN TETRACYCLINE

tient
pulation

mycin*

a new certainty

in antibiotic therapy,
particularly for
the 90% of patients
treated at home
and in the office

Superior control of infectious diseases through superior control of the changing microbial population is now available in a new formulation of tetracycline, outstanding broad-spectrum antibiotic, with oleandomycin, Pfizer-discovered new antimicrobial agent which controls resistant strains. The synergistic combination now brings to antibiotic therapy: (1) a new fuller antimicrobial spectrum which includes even "resistant" staphylococci; (2) new superior protection against emergence of new resistant strains; (3) new superior safety and toleration.

*TRADEMARK

Pfizer

superior control of infectious disease through superior control of the changing microbial population

new

Sigmamycin*

OLEANDOMYCIN TETRACYCLINE

A synergistically strengthened multi-spectrum antibiotic

Sigmamycin is a new antibiotic formulation providing: (1) the unsurpassed broad-spectrum activity of tetracycline, the outstanding broad-spectrum antibiotic discovered and identified by Pfizer; (2) the action of oleandomycin, the new antimicrobial agent which combats those strains, particularly among staphylococci, now resistant to tetracycline and other antibiotics.

Sigmamycin embodies a new concept in the use of antibiotics, for with this new synergistically active preparation, the development of refractory pathogens and their emergence as important sources of superinfection are more fully controlled.

New superior safety and toleration—Sigmamycin brings to antibiotic therapy new superior safety, new unexcelled toleration because: (1) tetracycline, an outstandingly well-tolerated antibiotic, is formulated with oleandomycin, also known to be remarkably free of adverse reactions; (2) the synergism between oleandomycin and tetracycline enhances antimicrobial potency.

Dosage: 1 to 2 capsules q.i.d.

Supplied: Capsules, 250 mg. (oleandomycin 83 mg., tetracycline 167 mg.) Bottles of 16 and 100.

*TRADEMARK

Pfizer

PFIZER LABORATORIES, *Division, Chas. Pfizer & Co., Inc.,* Brooklyn 6, N. Y.

abnormal capillary permeability and fragility frequently occur in and are aggravated by...

habitual and threatened abortion

certain respiratory infections

diabetic and other retinopathies

gingival bleeding; epistaxis

hypertension

gastrointestinal bleeding

C.V.P. is a specific aid in the prevention and correction of capillary fault in such conditions

CVP

Each C.V.P. capsule
or each 5 cc. of syrup
(approx. one teaspoonful) provides:

Citrus Bioflavonoid Compound	100 mg.
Ascorbic Acid (vitamin C) . . .	100 mg.

capsules: bottles of 36, 100, 500, 1000.
syrup: bottles of 4 oz., 16 oz. and gallon.

new!

duo-C.V.P.

(double strength C.V.P.)

Each duo-C.V.P. capsule provides:

Citrus Bioflavonoid Compound	200 mg.
Ascorbic Acid (vitamin C) . . .	200 mg.

capsules: bottles of 100, 500 and 1000.

C.V.P. helps diminish increased capillary permeability, fragility, and resultant bleeding by acting to maintain the integrity of the intercellular cement of capillary walls.

C.V.P. provides the many active bioflavonoid factors of the whole citrus bioflavonoid complex. C.V.P. is water-soluble and is thus readily absorbed and utilized, in contrast to purified hesperidin and rutin which are poorly soluble in water.

SAMPLES on request **u.s. vitamin corporation**
(Arlington-Funk Labs., division)
250 E. 43rd St., New York 17, N. Y.

Get the Facts!!

about the

PROFESSIONAL CREDIT PROTECTIVE BUREAU

The Professional Credit Protective Bureau has proved very beneficial to many professional people who have adopted this excellent credit control and collection service.

We urge you to make use of this service since it will be of great benefit in recovering long delinquent accounts and in eliminating, through proper control measures, the accumulation of slow and bad accounts.

Professional Credit Protective Bureau
701 Metropolitan Bldg., Minneapolis 1, Minn.

YES, I would like to give the PROFESSIONAL CREDIT PROTECTIVE BUREAU a trial. Please ask one of their representatives to call on me without obligation to explain the plan in detail.

NAME ....

ADDRESS ....

Journal Report:

Hypertensive symptoms relieved in 96% of patients

"Comparison of pentolinium [Ansolysen] with other preparations in 25 patients with severe essential hypertension, for whom all other methods of management had failed, showed that pentolinium is the most effective of available agents in reducing dangerously high blood pressure to the desired levels, and in modifying some of the complications of hypertension, as cardiac decompensation, cardiomegaly and retinopathy. . . .

"In 96 per cent (24 patients) clinical symptoms were relieved and the blood pressure maintained at comfortable levels. . . ."[1]

ANSOLYSEN®

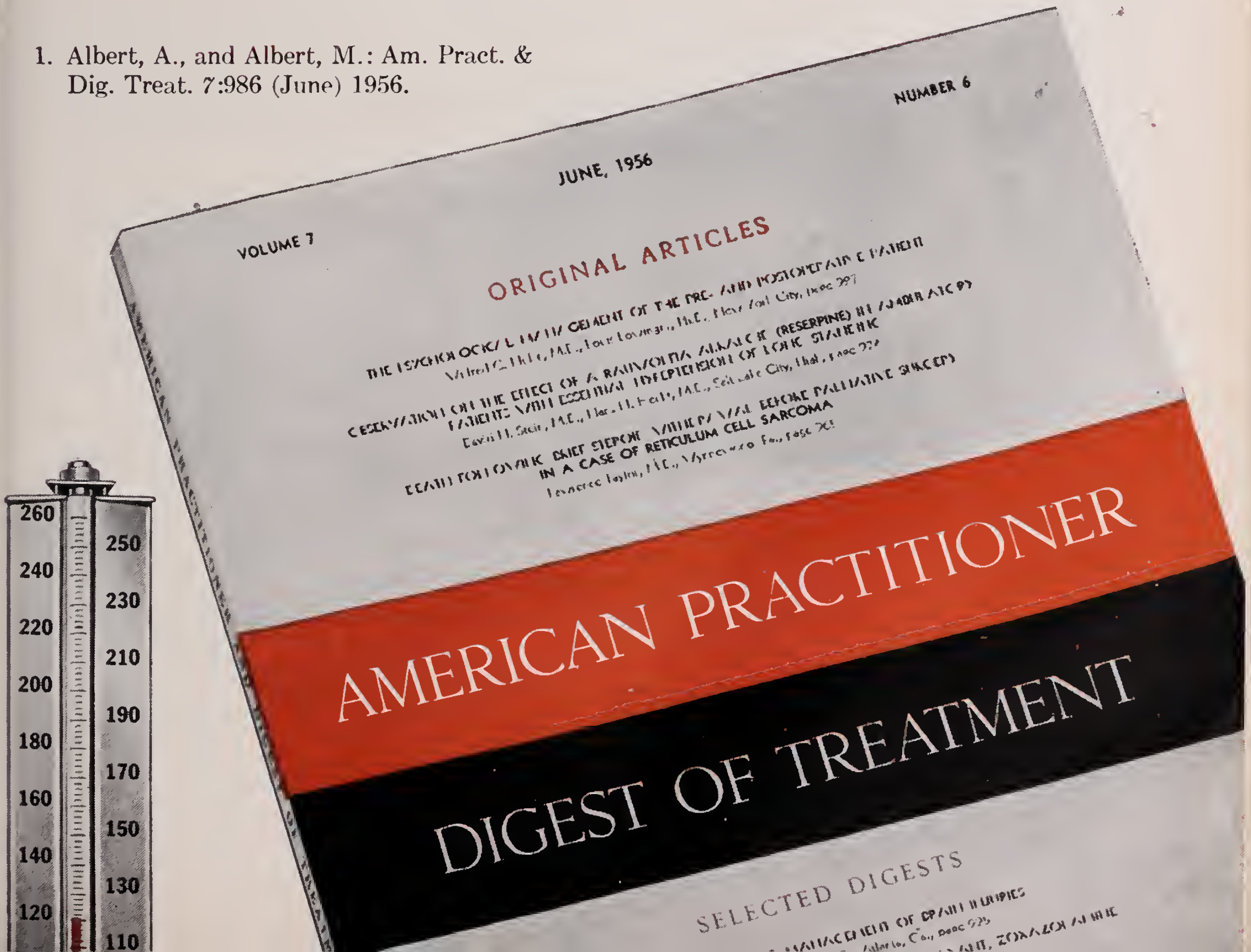
TARTRATE

Pentolinium Tartrate

Lowers Blood Pressure

Wyeth®
Philadelphia 1, Pa.

1. Albert, A., and Albert, M.: Am. Pract. & Dig. Treat. 7:986 (June) 1956.



NUMBER 6

JUNE, 1956

VOLUME 7

ORIGINAL ARTICLES

AMERICAN PRACTITIONER

DIGEST OF TREATMENT

SELECTED DIGESTS

NEW

For Pain-F

of ever

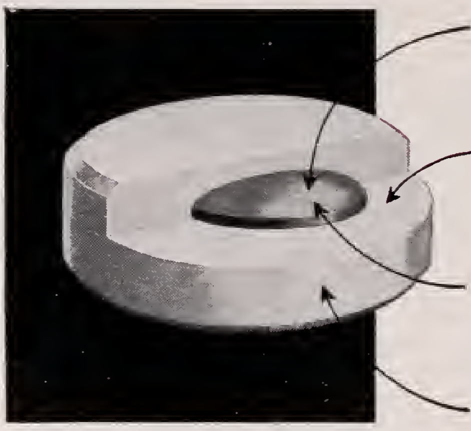
In "Rheumatis

M*ul*

TEM

combine:

THE PROPER FORMULA
PROPERLY FORMULATED



Physical separation of the steroid component from the aluminum hydroxide as provided by the Multiple Compressed Tablet construction assures full potency and stability of prednisolone.

PREDNISOLONE

+

ASPIRIN *(0.3 Gm.)*. . . .

+

ASCORBIC ACID

+

ANTACID *(0.2 Gm.)*. . . .

* Early rheumatoid arthritis	Synovitis
Rheumatoid spondylitis	Tenosynovi
Osteoarthritis	Myositis
Still's disease	Fibrositis
Psoriatic arthritis	Neuritis
Bursitis	

erformance

tvities

atients

mpressed **T***ablets*

OGEN®

. . . . . for anti-inflammatory, anti-rheumatic benefits *at effective low dosage.*

. . . . . for analgesia plus additional anti-rheumatic activity.

. . . . . for anti-stress support that guards against adrenal ascorbic acid depletion.
(Ascorbic Acid present as 60 mg. Sodium Ascorbate.)

. . . . . dried aluminum hydroxide gel minimizes the possibility of gastric distress.

DOSAGE: *1-4 TEMPOGEN Tablets t.i.d. or q.i.d. (TEMPOGEN Forte, 1 or 2 tablets t.i.d. or q.i.d.) for one or two weeks. Then lower by 1 tablet every four or five days to maintenance level.*

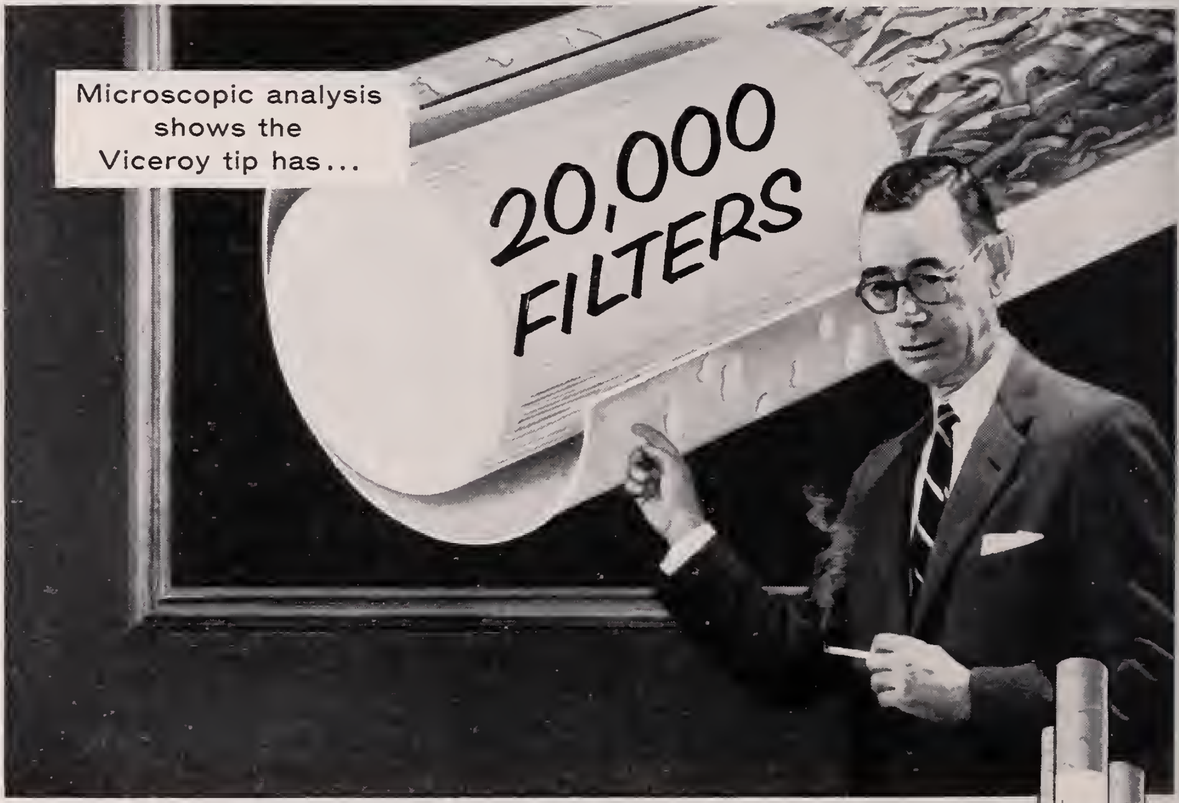
SUPPLIED: *TEMPOGEN and TEMPOGEN Forte —in bottles of 100 Multiple Compressed Tablets. (TEMPOGEN Forte provides 2 mg. of prednisolone.)*

MSD

MERCK SHARP & DOHME
DIVISION OF MERCK & CO., INC.
PHILADELPHIA 1, PA.

HERE'S WHY SO MANY DOCTORS NOW SMOKE AND RECOMMEND

VICEROY


Microscopic analysis shows the Viceroy tip has...
20,000 FILTERS

Twice as Many Filters
AS THE OTHER TWO LARGEST-SELLING FILTER BRANDS
For the Smoothest Taste in Smoking!

COMPARE! HOW MANY FILTERS IN YOUR FILTER TIP?
(REMEMBER—THE MORE FILTERS THE SMOOTHER THE TASTE!)

Viceroy
TWICE AS MANY FILTERS
Brand B
Only HALF the FILTERS
Brand C
LESS than HALF the FILTERS

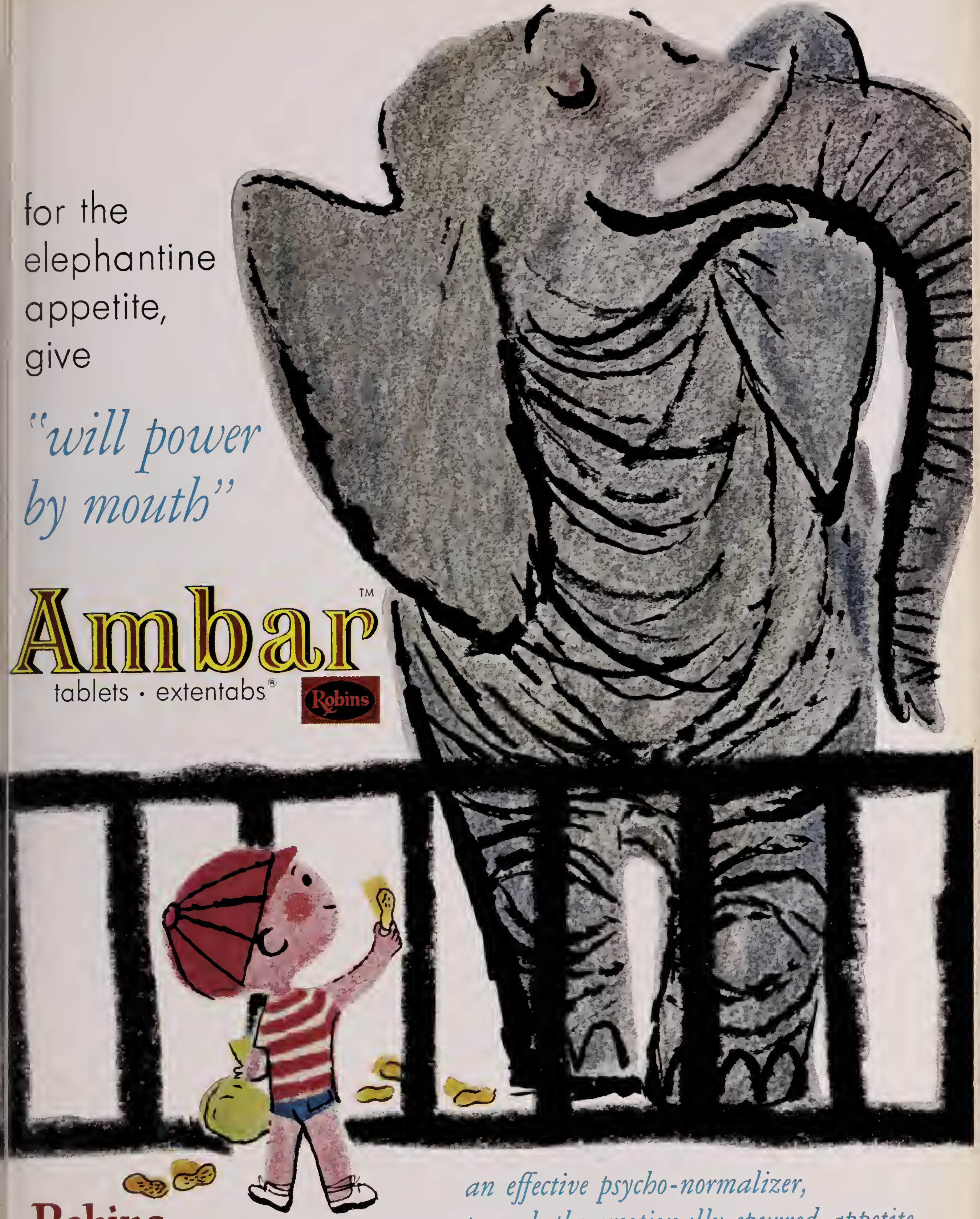
VICEROY'S EXCLUSIVE FILTER IS MADE FROM PURE CELLULOSE—SOFT, SNOW-WHITE, NATURAL!

TWENTY
VICEROY
Filter Tip
CIGARETTES
KING-SIZE

for the
elephantine
appetite,
give

*"will power
by mouth"*

Ambar™
tablets · extentabs®



Robins

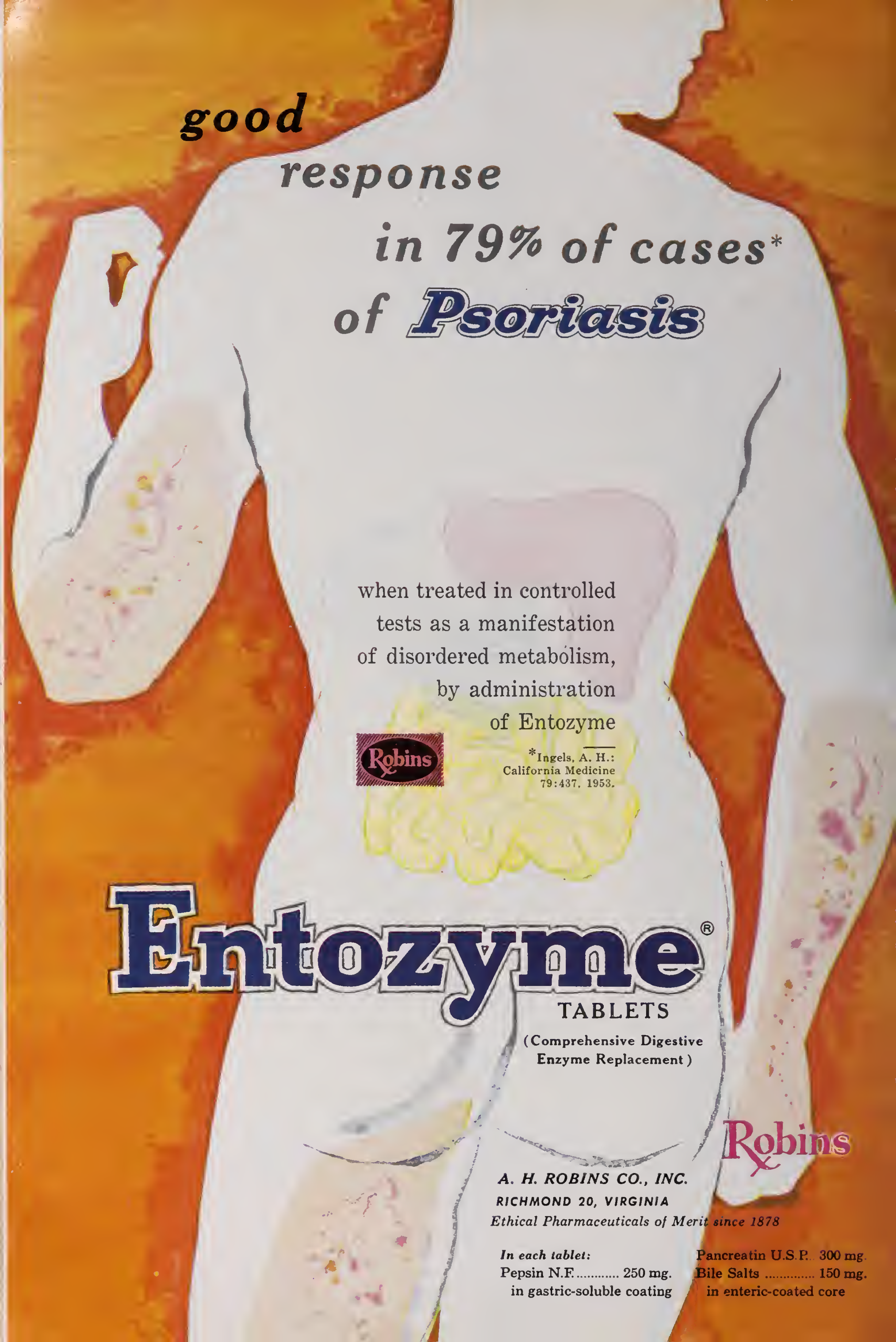
*an effective psycho-normalizer,
to curb the emotionally spurred appetite*

Robins

	In each Tablet	*Extentab*
Methamphetamine	3.33 mg.	10.0 mg.
Phenobarbital	21.6 mg. (⅓ gr.)	64.8 mg. (1 gr.)

Methamphetamine for central nervous stimulation (more potent than amphetamine) • with phenobarbital control, in optimal ratio • as plain Tablets — or as Extentabs®, that work all-day on a single dose

A. H. ROBINS CO., INC., Richmond 20, Virginia
Ethical Pharmaceuticals of Merit since 1878



good response in 79% of cases* of Psoriasis

when treated in controlled tests as a manifestation of disordered metabolism, by administration of Entozyme

Robins

*Ingels, A. H.: California Medicine 79:437, 1953.

Entozyme®

TABLETS

(Comprehensive Digestive Enzyme Replacement)

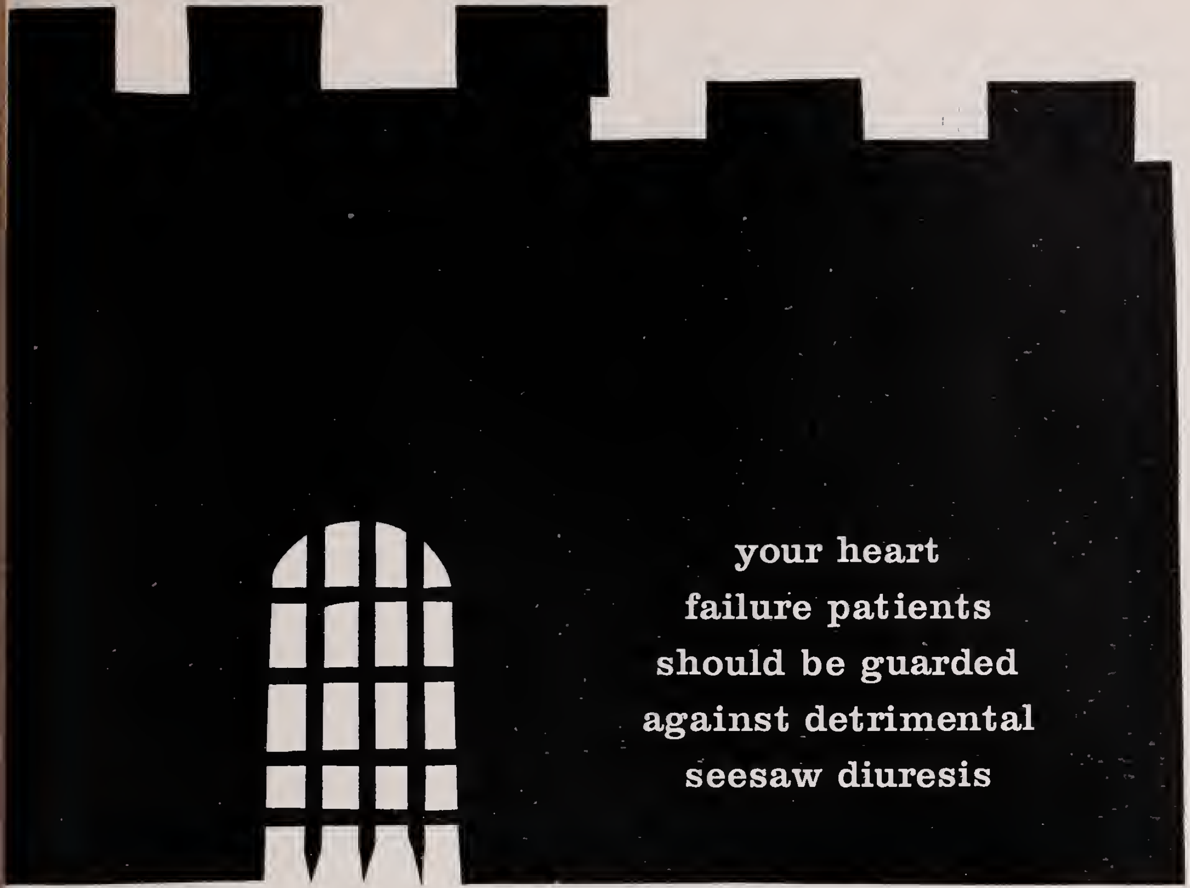
Robins

A. H. ROBINS CO., INC.
RICHMOND 20, VIRGINIA
Ethical Pharmaceuticals of Merit since 1878

In each tablet:

Pepsin N.F. .... 250 mg.
in gastric-soluble coating

Pancreatin U.S.P. ... 300 mg.
Bile Salts .... 150 mg.
in enteric-coated core


your heart
failure patients
should be guarded
against detrimental
seesaw diuresis

PATIENTS IN FAILURE NEED AN ORGANOMERCURIAL

Limiting dosage to once daily to avoid refractoriness, or omitting alternate days to circumvent gastrointestinal irritation—necessary with some diuretics—results in a seesaw of diuresis with fluid reaccumulation and recurrent strain on the already failing heart.

With the organomercurials, dosage is individualized and administered as needed, to produce sustained, dependable diuresis.

TABLET
NEOHYDRIN®
BRAND OF CHLORMERODRIN (18.3 MG. OF 3-CHLOROMERCURI-2-METHOXY-PROPYLUREA EQUIVALENT TO 10 MG. OF NON-IONIC MERCURY IN EACH TABLET)

a standard for initial control of severe failure

MERCUHYDRIN® SODIUM
BRAND OF MERALLURIDE INJECTION

LAKESIDE

02556

24-hour control

for the majority of diabetics

10 cc.
"WELLCOME"
LOBIN INSUL
WITH ZINC
'B.W. & CO'
40 UNITS IN 1 CC
KEEP IN A COLD PLACE
Burroughs Wellcome
MADE IN U.S.A.

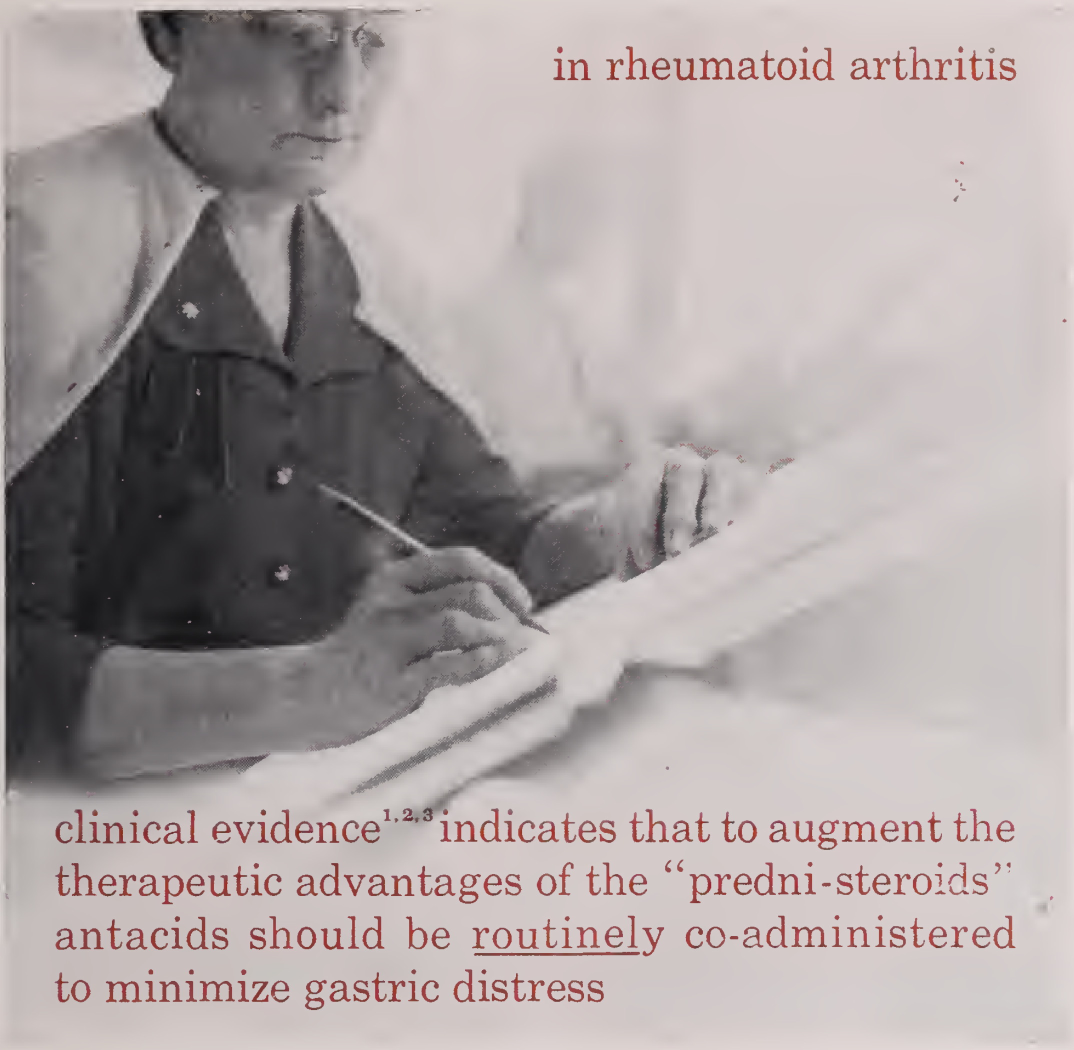
GLOBIN INSULIN

'B.W. & CO.'®

a clear solution . . . easy to measure accurately

Discovered by Reiner, Searle, and Lang
in The Wellcome Research Laboratories

BURROUGHS WELLCOME & CO. (U.S.A.) INC. • Tuckahoe 7, New York



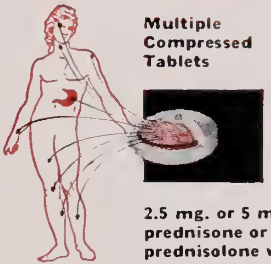
in rheumatoid arthritis

clinical evidence[1,2,3] indicates that to augment the therapeutic advantages of the "predni-steroids" antacids should be routinely co-administered to minimize gastric distress

ROUTINE CO-ADMINISTRATION MEANS

'Co-Hydeltra'

(Prednisolone Buffered)



Multiple Compressed Tablets

All the benefits of the "predni-steroids" plus positive antacid action to minimize gastric distress.

2.5 mg. or 5 mg. prednisone or prednisolone with 50 mg. magnesium trisilicate and 300 mg. aluminum hydroxide gel.

'Co-Deltra'

(Prednisone Buffered)

MSD

MERCK SHARP & DOHME
DIVISION OF MERCK & CO., INC.
PHILADELPHIA 1, PA

References: 1. Boland, E. W., *J.A.M.A.* 160:613 (February 25) 1956. 2. Margolis, H. M. *et al., J.A.M.A.* 158:454 (June 11) 1955. 3. Bollet, A. J. *et al., J.A.M.A.* 158:459 (June 11) 1955.

'CO-DELTRA' *and* 'CO-HYDELTRA' *are trademarks of* MERCK & CO., INC

when dandruff stands out as a si

prescribe **SEBIZON**
Lotion

for an extra therapeutic dividend

a method of choice for **rapid control** of seborrhea of the scalp and seborrheic dermatitis in children as well as adults...**no complicated shampoo or timing procedures:** patient rubs in SEBIZON any time of the day, washes out when convenient ...acts as hair dressing: **no odor, no oily or greasy residue,** no tinting of hair.

especially useful when dandruff escapes control again

antiseborrheic and anti-infective
SEBIZON is a cream-type vanishing lotion containing 10% sulfacetamide sodium.

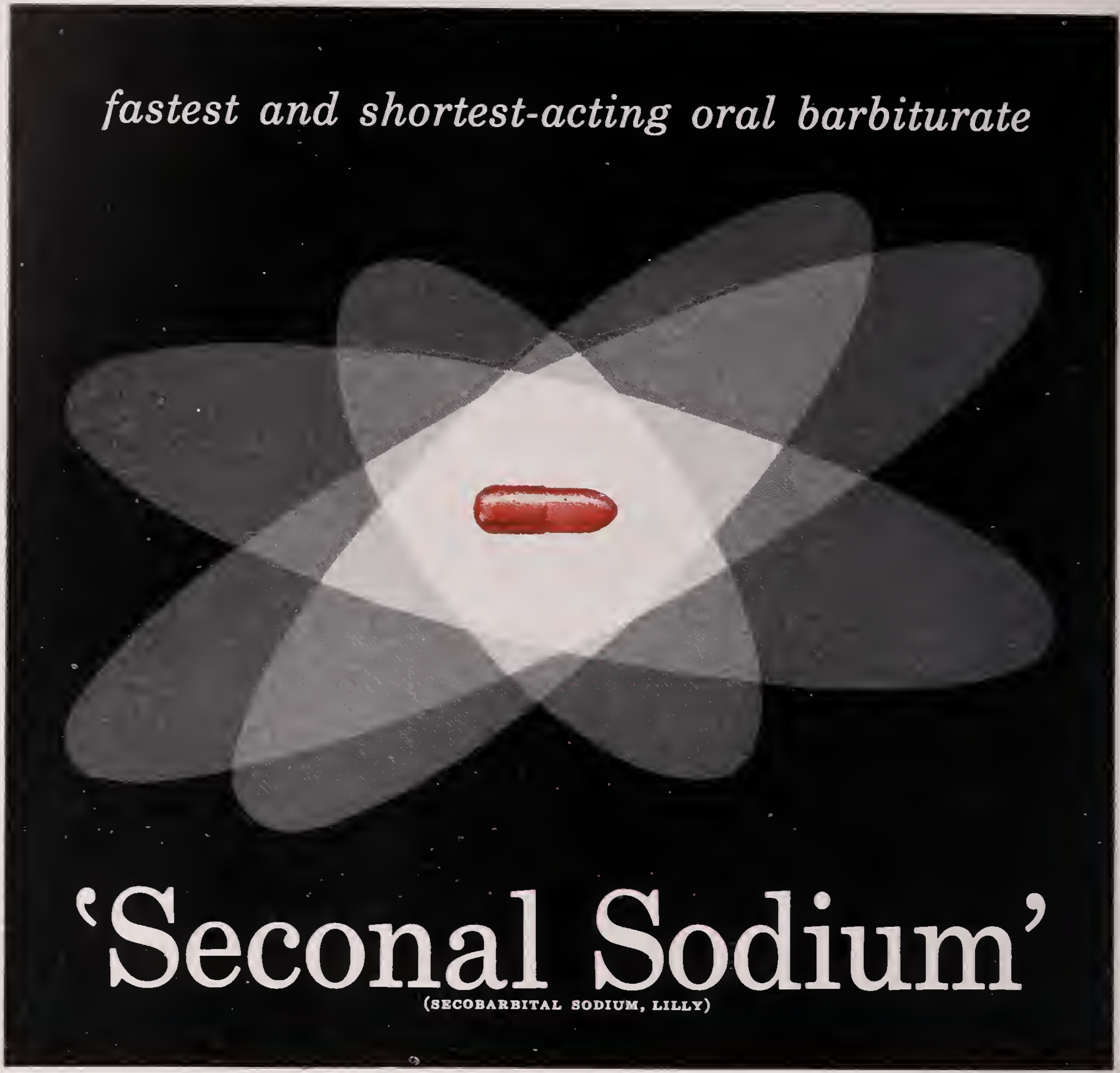
available on prescription only in 3 oz. plastic squeeze tube.

SEBIZON,® antiseborrheic preparation.

Schering
SZ-J-4106

ut not a complaint

Schering
SEBIZON
LOTION
SCHERING
3 OZ TUBE


fastest and shortest-acting oral barbiturate
'Seconal Sodium'
(SECOBARBITAL SODIUM, LILLY)

622011

Lilly
QUALITY / RESEARCH / INTEGRITY

The secret of sleep in a capsule

When simple insomnia is the presenting complaint, a bedtime dose of 'Seconal Sodium' is often indicated. Its effect is prompt—within fifteen to thirty minutes; relaxation and sleep follow quickly. Your patient awakens refreshed and well rested.

Available in 1/2, 3/4, and 1 1/2-grain pulvules at pharmacies everywhere.

80TH ANNIVERSARY 1876 · 1956 / ELI LILLY AND COMPANY

The Role of Surgery in the Treatment of Arteriosclerosis of the Major Vessels

THOMAS O. MURPHY, M.D.,
JOHN J. HAGLIN, M.D.,
C. WALTON LILLEHEI, M.D.,
RICHARD L. VARCO, M.D.
Minneapolis, Minnesota

THAT segment of our population represented by the older age group is increasing steadily. As a result, the therapeutic management of arteriosclerotic vascular disease states has assumed greater importance to physicians. So far, most of these effort have been palliative.

Palliative surgical therapy has been of these types: Sympathectomy to lessen the peripheral resistance in an ischemic area by causing a permanent but localized vasodilation; thromboendarterectomy to re-establish arterial continuity by excision of the intraluminal obstruction; bypass shunts around the obstruction; and, lastly, replacement of occluded sites by grafts of homologous arteries, autogenous veins, or plastic prostheses.

Sympathectomy

Lumbar sympathectomy, as described by Royal[1] in 1924, has been of some value in the treatment of peripheral vascular occlusions. We prefer a bilateral resection of the sympathetic ganglia from lumbar 1 to 4 on the more affected side and from lumbar 2 to 4 ganglia on the side of lesser involvement. This avoids sterility in the young male secondary to an inability to ejaculate. Either a lateral or an anterior retroperitoneal approach may be used, depending upon the body build of the patient (Fig. 1). If the abdominal cavity is opened for an attempt at restitution of arterial continuity, a concomitant transabdominal sympathectomy may also be performed, although exposure of the sympathetic trunks from this anterior approach can be more difficult. We generally prefer to add sympathetcomy in all attempts at revascularization of the lower extremity. The dilatation of the collateral vessels, thus induced, add to the protection of the extremity if there is a failure of other techniques to re-establish an adequate arterial flow. Also, after sympathectomy, the rate of the distal arterial flow is probably increased secondary to a decreased peripheral resistance and a secondary thrombosis may be less likely in the area of the arteriotomy.

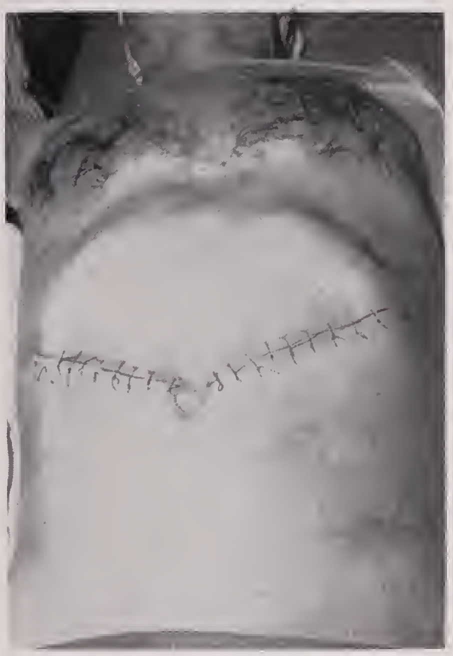


Fig. 1. Abdominal incisions for the anterior approach to a bilateral lumbar sympathectomy, with the patient lying supine on the operative table.

The initial salutary effect of sympathectomy for the appropriate case has been well document-

---

From the Department of Surgery, University of Minnesota Medical School, Minneapolis, Minnesota, and Minneapolis General Hospital, Minneapolis, Minnesota.

Presented as a part of the Continuation Courses on Recent Advances in Internal Medicine, February 13, 1956, and General Surgery, May 24, 1956, of the Graduate School of the University of Minnesota.

TABLE I. RELATIVE CHANGE IN PERIPHERAL PULSE VOLUME AFTER LUMBAR SYMPATHECTOMY, AT 20° C.

31 Studies

Percentage Increase	Number
Fall	1
0-100	2
100-200	2
200-300	2
300-400	3
400-500	1
500-600	5
600-700	1
700-800	1
800-900	0
900-1000	1
Over 1000	12

ed by the studies of DeBakey,[2] Coller,[3] and others. In thirty-one patients we, too, have attempted to carry out objective long term evaluations of our results after the operation. Electroplethysmographic measurements were made of the digit pulse volume before and after surgery (Table I). The series consists of an unselected six females and twenty-five males who were studied in a constant temperature room according to the method of Windsor.[4] Initial determinations were made prior to the sympathectomy and again after an interval of one to three years.

There was a seven-fold mean change in peripheral pulse volume following sympathectomy, with a range from minimal effect to a ten-fold increase. In ten per cent of the patients the change was minimal, and this observation was interpreted as signifying a fixation of the distal arterial bed. However, for the remainder of the group the procedure appeared to be beneficial.

In regard to sympathectomy, its greatest value seems to be for patients with arterial occlusions in the thigh and/or popliteal areas. The results in diabetic persons with arteriopathies were disappointing, as this group was largely represented by individuals with terminal arterial disease. For the older patients, the accomplishments were insignificant and, in fact, for 50 per cent of the persons over seventy years of age, the peripheral pulsations after sympathectomy decreased. The amount of relief of claudication by sympathectomy was disappointing in our series unless ancillary procedures were included. Our experience suggests that a real increase in skin temperature on the sympathectomized extremity was associated with an increase in cutaneous blood flow, which partially protected the extremity against early skin breakdown.

Thromboendarterectomy

The introduction of aortography and femoral angiography have given the surgeon a better method of evaluating the location and extent of arterial occlusions. These techniques have changed th earlier concept that arterial occlusions were usually generalized in distribution, to the idea of segmental arterial disease as a frequent cause of th ischemic extremity. Once this premise was appreciated, a number of methods for the reconstitution of the arterial pathways developed.

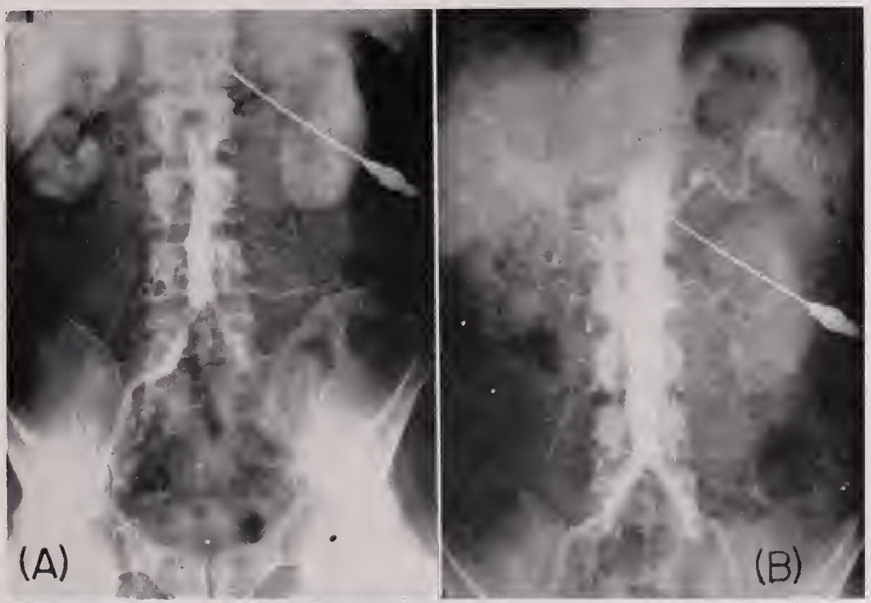
The technique of thromboendarterectomy was introduced by Dos Santos[5] in 1947. In this procedure the occluded arterial segment is incised longitudinally and the localized thrombus as well as the diseased intima are enucleated. The arterial wall is reconstituted from the remaining media and adventitia. Three important technical factors should be observed. The distal arterial bed should be protected against thrombosis by heparinization during the interval of arteriotomy while the artery is clamped. The distal intima must be firmly attached to the arterial wall to prevent a subsequent subintimal dissecting process causing obstruction and secondary thrombosis. To obviate the second factor we have found it advantageous either to suture the intima to the wall at the distal line of resection, or to transect the artery completely at this point and anastomose these ends. Finally, there must be an ample lumen distal to provide for drainage past the endarterectomy site. In the healing process of this raw area, new intima regenerates by the organization of fibrin deposited upon the arterial wall and from the migration of endothelial cells. The endarterectomy procedure has lent itself well to the management of short arterial occlusions of the terminal aorta, iliac, and femoral arteries.

TABLE II. THROMBOENDARTERECTOMY

Artery	Number	Successful	Failure
Aorta Iliac Stenosis	1		1
Aorta Iliac Bilateral	3	1	2
Aorta Iliac Unilaeral	2	2	
Iliac	4	3	1
External Iliac	4	3	1
Ilio Femoral	3	1	2
	17	10	7

Expired: 3 Amputation: 3

Since 1953 we have employed this technique in seventeen patients. They have been observed from six months to four years (Table II). We have not attempted this procedure below the femoral area due to the small size of the arteries here and the degree of distal arterial disease commonly encountered in this group. Our experience with aorta-iliac stenosis though limited has revealed a potentially grave complication of endarterectomy in this area. When the collateral channels are inadequate around this lesion and if it is necessary to occlude the distal blood flow for any length of time during the operative procedure, a "tourniquet shock syndrome" can be provoked following release of the occluding clamp. Another and more serious complication of endarterectomy should the procedure fail, is loss of the extremity.



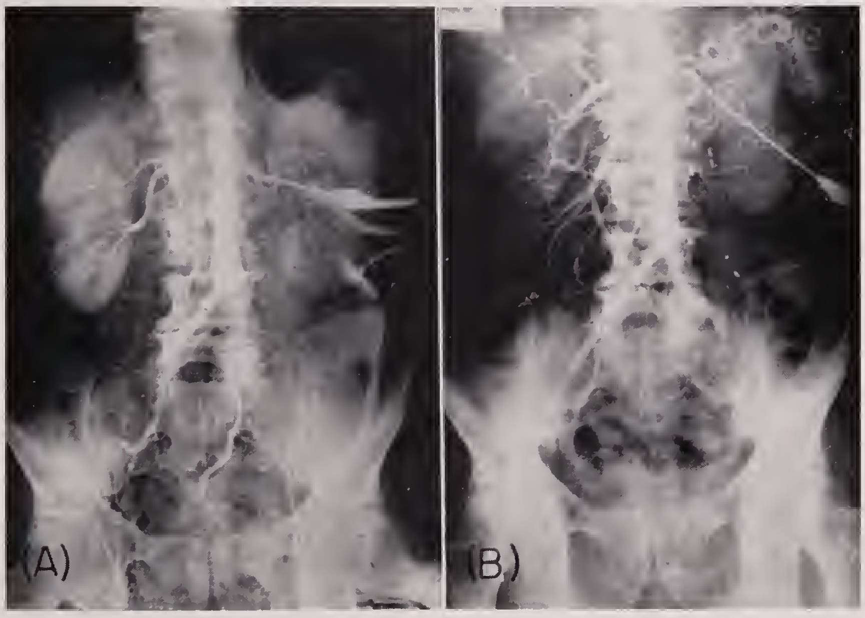


Fig. 2. *(Above)* (*a*) Preoperative aortogram showing bilateral aorta-iliac artery stenosis with left hypogastric occlusion. (*b*) Postoperative aortogram—thromboendarterectomy—showing an excellent distal arterial flow.

Fig. 3. *(Below)* (*a*) Preoperative aortogram showing a left iliac and right external iliac occlusion. (*b*) Postoperative aortogram after thromboendarterectomy showing re-established arterial continuity.

Of the six patients with aorta-iliac disease, three were failures and three patients have had excellent results (Figs. 2 and 3). One failure took place at surgery and most likely represented a lack of distal arterial "run off" because of the advanced state of peripheral disease. There was another unsatisfactory result in a patient who developed thrombosis at the operative site one year after the endarterectomy. One patient expired

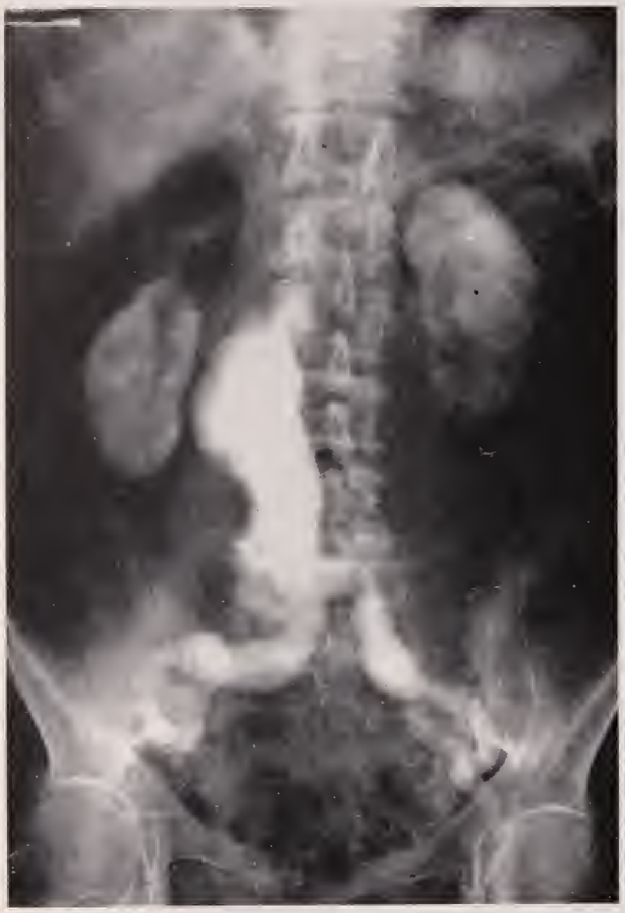


Fig. 4. Aortogram of an aorta iliac aneurysm which was replaced with a polyvinyl arterial prosthesis.

from turniquet shock and myocardial infarction during the immediate postoperative period.

Eight patients had ilio-hypogastric or external iliac occlusions, and in all but two the initially successful result has persisted. One of the latter expired of an acute myocardial infarct on the fifth postoperative day; the other developed a hematoma at the arteriotomy site which required replacement with an arterial homograft.

Three patients with ilio-femoral disease were operated upon. In one the procedure was successful; the remainder were failures. One person expired from an acute myocardial infarction on the tenth postoperative day and the other case developed a re-thrombosis. Summarizing the results in this series of seventeen attempts at arterial reconstitution by thromboendarterectomy, seven failed and ten succeeded. The degree of improvement for the latter has been good. Here the peripheral pulse volumes are often many times the preoperative value. Rest pain and claudication have been relieved in all instances.

TABLE III. THROMBOENDARTERECTOMY

17 Patients

Artery	Result	Comment
Aorta Iliac Stenosis	Expired	Tourniquet shock
Aorta Iliac, Bilateral	Good	One side is open at 2 months
Aorta Iliac, Bilateral	Failure	Thrombosed at 1 year
Aorta Iliac, Bilateral	Failure	Bilateral amputations
Aorta Iliac, Unilateral	Excellent	36 months postoperative
Aorta Iliac Hypogastric	Excellent	24 months postoperative
Iliac	Failure	Hematoma, replaced with a homograft
Iliac	Excellent	4 months postoperative
Iliac and Hypogastric	Excellent	24 months postoperative
Iliac	Excellent	26 months postoperative
External iliac	Excellent	28 months postoperative
External iliac	Excellent	Expired 1 year postoperative from a C.V.A.
External iliac	Excellent	24 months postoperative
External iliac	Expired	5th postoperative day from acute coronary thrombosis
Ilio-femoral	Expired	10th postoperative day due to a coronary thrombosis
Ilio-femoral	Failure	Amputation
Ilio-femoral	Excellent	36 months postoperative

TABLE IV. ARTERIAL HOMOGRAFTS

Artery	Lesion	Number	Successful	Failure
Subclavian	Occlusion	1	1	
Aorta	Aneurysm	7	6	1
Aorta Bifurcation	Aneurysm	7	4	3
Aorta Femoral	Occlusion	2	1	1
Iliac	Occlusion	1	1	
Femoral	Occlusion	1	1	
		19	14	5

The number of postoperative complications in this group is larger than desired, but reflects in a fair measure the general condition of the vascular system for the type of arteriosclerotic patient. The particular lesion undergoing surgical treatment is but one aspect of generalized arterial disease, e.g. three patients expired with acute myocardial infarcts during the postoperative period and another died one year after surgery of a cerebral vascular accident. Too, one developed a middle cerebral artery occlusion on the fifth postoperative day but eventually recovered (Table III).

Arterial Replacement

When the patient has either longer arterial occlusions or aneurysmal formation, the techniques of arterial replacement have proven somewhat more satisfactory (Fig. 4). We have used arterial homografts and plastic prosthesis. We prefer the former. To date, nineteen arterial homografts have been utilized, with five failures (Table IV). Three of the bad results occurred in patients with a ruptured aortic aneurysm. Despite recovery from the immediate operative problem, they eventually succumbed to renal failure. Another replacement of a thoraco-abdominal aneurysm failed due to the development of a generalized bleeding tendency late in the course of the surgery. To

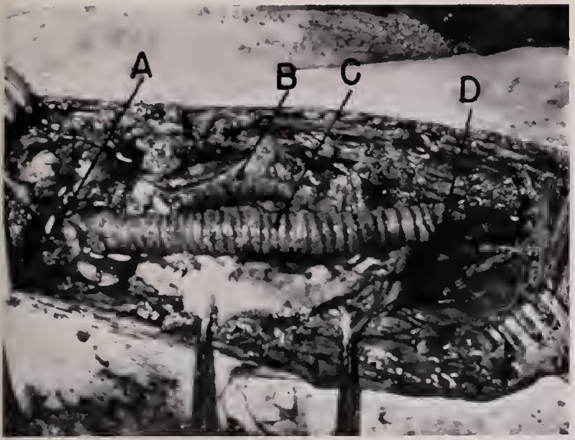


Fig. 5. Arterial replacement of a femoral aneurysm with a "crimped" polyvinyl arterial prosthesis. *(a)* Common femoral artery *(b)* Aneurysm prior to removal *(c)* Ivalon prosthesis *(d)* Superficial femoral artery.

date, only one arterial homograft has thrombosed. This was an instance of an iliac artery by-pass. This faliure may well have been due to a poor status of the arterial vessel distally.

Hufnagel[6] and Schumacker[7] and others have presented encouraging data using such arterial prostheses as vinyon-N, nylon and polyethylene, orlon and dacron. Shumway and Lewis[8] have described experimental studies with the use of a polyvinyl sponge, and we have also used this material as an arterial prosthesis in sixteen patients (Table V). It is easy to fabricate, to suture, and may be "crimped." This tends to minimize internal kinking as the prosthesis is flexed across a movable joint. The wavy external contour reduces the problem of internal clots forming at bend sites (Fig. 5). An aortic bifurcation graft of ivalon thrombosed one month postoperatively and required a re-operation to remove a clot in the iliac limb of this bifurcation graft. The viability of this extremity was preserved, but nine days later the patient succumbed due to hemorrhage from the distal (iliac) anastomotic site on this same side. One femoral plastic graft became infected and, though promptly removed, that patient developed multiple abscesses, a septicemia and expired. Another plastic replacement for a common iliac artery thrombosed during the operative procedure. One patient in whom a ruptured aortic aneurysm was replaced by an ivalon prosthesis expired from a myocardial infarction and renal shutdown on the fifth potoperative day. Four other plastic arterial prostheses thrombosed after functioning for three to twelve weeks. The remaining eight of the sixteen ivalon grafts appear to be working all right to date, although the follow-up period is still short. On the basis of this experience we believe that homografts are preferable for replacement of arterial segments.

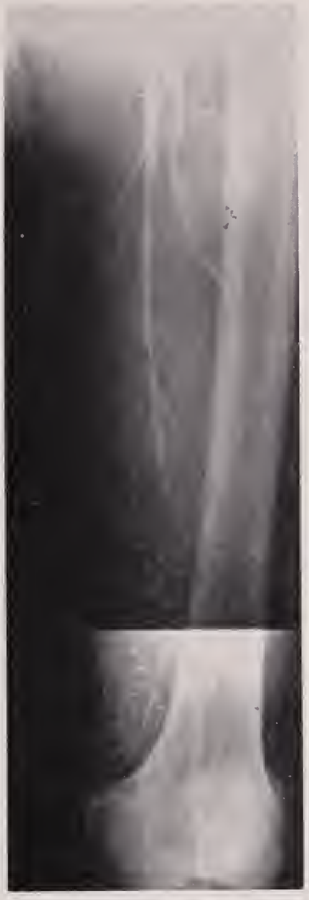


Fig. 6. Femoral arteriogram showing occlusion of the superficial femoral artery which was satisfactorily grafted with a "by-pass" technique.

TABLE V. COMPRESSED POLYVINYL (IVALON) ARTERIAL PROSTHESES

Artery	Number	Successful	Failure
Aorta	4	3	1
Aortic Bifurcation	2	1	1
Aorta Femoral	1		1
Iliac	3	2	1
Ilio Femoral	4	2	2
Femoral Popliteal	2		2
	16	8	8

Expired: 2 Amputation: 0

Distal to the common femoral area, segmental arterial occlusions are most common in Hunter's canal (Fig. 6). The small size of the femoral artery here increases the danger from subsequent thrombosis after thromboendarterectomy. Like-

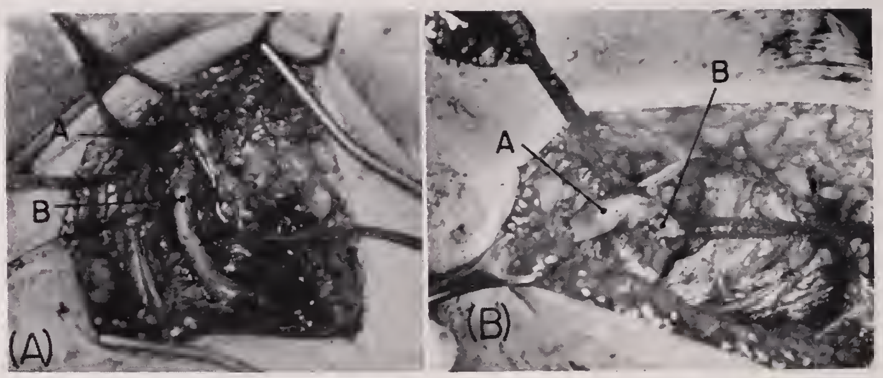


Fig. 7. *(A)* Functioning saphenous vein autograft as an arterial by-pass showing the femoral exposure. A. Saphenous vein graft. B. Common femoral artery. *(B)* Popliteal exposure. A. Saphenous vein graft. B. Popliteal artery.

TABLE VI. AUTOGENOUS SAPHENOUS VEIN BY-PASS GRAFTS

Artery	Number	Successful	Failure
Aorta Femoral	2	2	
Aorta Iliac	1		1
Ilio Femoral	2	1	1
Femoral Popliteal	13	11	2
Popliteal	2	2	
	20	16	4
Expired: 0 Amputation: 0			

wise, arterial replacement techniques as carried out by Linton[9] have been disappointing. We have preferred the use of saphenous vein autografts in this area using a "by-pass" technique as described by Kunlin[10,11] With this procedure, the collateral blood supply to the extremity is not destroyed by an extensive dissection along the course of the artery. The procedure has proven simple and involved scant operative risk. In addition, the dependence upon material from an arterial homograft bank has been reduced. We have used saphenous vein autografts to by-pass occluded segments of peripheral arteries in eighteen instances (Table VI). Two intra-abdominal grafts of this type were also successful. One of these has remained in place over eighteen months without evidence of aneurysmal dilatatin at subsequent angiography. Of two iliofemoral by-passes, one was successful. The most frequent use (thirteen patients) of this graft has been to by-pass superficial femoral arterial occlusions. Eleven persons in this group of cases apparently have patent and well functioning shunts at this time. Two popliteal by-pass grafts were attempted successfully.

As we have indicated earlier for other grafting procedures, the long term results will depend primarily upon the adequacy of the distal vascular bed. In only one of the four cases which failed was there deemed to be an adequate distal run off flow. In this patient also there existed the extenuating fact that a femoral aneurysm compressed the soft graft and probably contributed to its ultimate thrombosis.

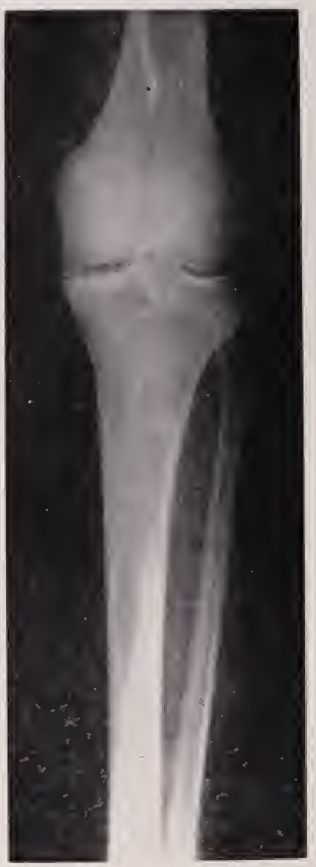


Fig. 8. Femoral arteriogram showing popliteal artery occlusion without distal large artery visualization, treated by lumbar sympathectomy.

The presence of gangrene of a distal digit does not contraindicate this type of surgical procedure. One of our successful superficial femoral by-pass grafts was completed in a patient with gangrene of two toes. After the shunt around the superfiical femoral arterial occlusion was working, the gangrenous area failed to progress, and healing occurred at that line of demarcation. The establishment of a successful graft may complicate the problem of post-debridement bleeding because a previously dry wound can bleed once a "high pressure" flow has been re-established (Fig. 7).

To date, below the popliteal artery, the small size of the arterial lumen and technical difficulties related to exposure of the artery for an anastomosis has precluded attempts using the by-pass technique. For occlusive disease of the calf, lumbar sympathectomy is about the only definite surgical therapy of demonstrated value (Fig. 8).

Summary and Conclusions

A review of the surgical techniques used in the treatment of vascular occlusions has been presented and the early results of these procedures are discussed. For short length terminal aortic and ilio-femoral occlusions we prefer a thromboendarterectomy. For longer occlusions and aneurysms, an arterial replacement is deemed best and the arterial homograft seems to be the agent of choice. For some patients, combinations of thromboendarterectomy with an arterial homograft are of value. The use of ivalon fabricated prostheses for replacement of excised arterial segments has given less satisfactory results than preserved arterial homografts. Saphenous vein autografts as a by-pass are satisfactory in segmental femoral and popliteal occlusions. With the exception of the older age groups (over seventy years of age) and in diabetic terminal arteritis, a lumbar sympathectomy is felt to be of value in increasing arterial blood flow.

It is to be hoped that in the near future, studies in the field of lipid metabolism and transport will enable a more direct attack upon the basic causes of this disease.

References

1. Royal, N. D.: The treatment of spastic paralysis by sympathetic ramisection. Surg., Gynec. & Obst., 39:701-720, 1924.
2. DeBakey, M. E.; Creech, O; and Woodhall, J. P.: Evaluation of sympathectomy in arteriosclerotic peripheral vascular disease. Ann. Surg., 126:850-865. 1947.
3. Coller, F. A.; Campbell, K. W.; Harris, B. M.; and Berry, R. E. L.: The early results of sympathectomy in far-advanced peripheral vascular disease. Surgery, 26:30-40, 1949.
4. Windsor, T.: Clinical plethysmography. Angiology, 2:149-163, 1953.
5. Dos Santos, J. C.: Sur la desobstruction des thromboses arterielles anciennes. Med. Acad. de chir., 73:409-411, 1947.
6. Hufnagel, C. A.: Occlusive Arterial Disease. Minn. Med., 38:912-915, 1955.
7. Harris, E. J.; Shumacker, H. B., Jr.; Siderys, H.; Moore, T. C.; and Grice, P. F.: Pliable plastic aortic grafts, an experimental comparison of a number of materials. Arch. Surg., 71:449, 1955.
8. Shumway, N. E.; Gliedman, M. L.; and Lewis, F. J.: An experimental study of the use of polyvinyl sponge for aortic grafts. Surg., Gynec. & Obst., 100:703, 1955.
9. Linton, R. R., and Menendez, C. V.: Arterial homografts; a comparison of the results with end to end and end to side vascular anastomoses. Ann. Surg., 142:568, 1955.
10. Kunlin, J.: Le tratement de L'ischemie arterique par la greffe veineuse longue. Rev. de Chir. 70e Annee-Nos. 7-8, Juillet-aout, 1951.
11. Murphy, T. O., and Aust, J. B.: Use of greater saphenous vein autografts in the reconstruction of segmental arterial occlusions. Minn. Med., 38:918-921, 1955.

VALUE OF X-RAY IN LOCATING BRAIN TUMORS

The value of radiological examination in detecting brain tumors has been emphasized in a report from a Seattle, Washington, radiologist, Eva L. Gilbertson, who has published the results from a study of more than 660 patients with proven brain tumors. The report appears in the August, 1956, issue of the *American Journal of Roentgenology, Radium Therapy and Nuclear Medicine,* and was prepared in collaboration with Dr. C. Allen Good, radiologist at the Mayo Clinic, Rochester, Minnesota.

"The study was made in order to determine the value of roentgenological examination in the localization of lesions in the brain," Dr. Gilbertson pointed out.

"Some indication of an intracranial lesion was present in approximately two-thirds of the roentgenograms reviewed. Tumors of the pituitary gland produced the highest incidence of localizing signs," she continued.

The Seattle specialist advanced these conclusions in the report: In some patients with a brain lesion, the neurologic signs and symptoms are of such a nature that an x-ray examination is not necessary for localization. In these, radiographs are taken for corroborating evidence.

In another group of patients, the radiographs provide leads as to the anatomic site and extent of the tumor, and they may help to determine the method of surgical approach.

Leiomyosarcoma of the Small Bowel

LAWRENCE M. LARSON, M.D.
JOHN H. ROSENOW, M.D.
Minneapolis, Minnesota

WE have chosen to collect from the literature available to us those cases of leiomyosarcoma of the jejunum and ileum reported since 1930. The reports appearing prior to 1930 have been thoroughly detailed by Anderson and Doob.[1] Our aim is to review those case reports published since 1930 and to outline the history, findings and subsequent course in two personal cases. The accuracy of any statistical statements made on the basis of such a group of collected cases is not too great, since they are incomplete numerically, being small groups of cases, each reported by different observers employing differing clinical, surgical and pathologic approaches. In many reports, the data given are vague and incomplete. These tumors when seen in the duodenum present quite different clinical and therapeutic problems.[1,17,25,52] The only article concerning leiomyosarcomas of the entire gastrointestinal tract in one exhaustive presentation is that of Golden and Stout.[22]

The total number of cases of this type of tumor is undoubtedly much larger than the number of cases collected from the available literature would indicate. For example, an article describing malignant tumors of the small intestine treated surgically at the Mayo Clinic from 1907 to 1939 reported eight cases of leiomyosarcoma.[33] This and other similar series[49] have not been the subject of detailed case reports and are therefore not available for analysis. Thus, it is not possible to be dogmatic on the basis of such an incomplete series of cases.

Even in the best of hands, there may justifiably be room for doubt as to the pathologic diagnosis, as pointed out by Frank, Miller and Bell,[18] who discussed at some length the difficulties in differentiating among fibrosarcoma, leiomyosarcoma and neurofibrosarcoma. More recently, Golden and Stout[22] have clarified this matter, showing that these tumors are of smooth-muscle origin. MacFarland[32] found in a collection of reports of almost 60,000 cases of uterine myomas that pathologic criteria for malignancy in this type of growth were inconsistent. The percentage of malignant change reported by various observers varied from zero to 10 per cent.

Statistics concerning the occurrence of this lesion in the small intestine vary widely. It is certain, however, that leiomyosarcoma of this portion of the gastrointestinal tract is an extremely rare condition. Raiford,[38] in 1932, in a most exhaustive article, reported a total of 986 tumors of the gastrointestinal tract, benign and malignant, seen at the Johns Hopkins Hospital. Included in this total were fifty benign and thirty-eight malignant tumors of the small intestine. Of the malignant tumors, none was a leiomyosarcoma. Of 813 tumors of the entire gastrointestinal tract seen at the Army Institute of Pathology in patients between the ages of eighteen and thirty-eight during 1941 to 1945, only three were leiomyosarcomas and none was in the small intestine.[14] Jones and Brubaker[28] reported twenty-two patients having surgically explored tumors of the small intestine at the Cleveland Clinic up to 1942. Only one instance of leiomyosarcoma was encountered. Surgically treated malignant lesions of the small intestine in the afore-mentioned series at the Mayo Clinic numbered 108; these represented 1.5 per cent of the surgical malignant lesions of the large intestine observed in the same period. Of these 108 tumors, eight were leiomyosarcomas of the jejunum and ileum.

Cameron,[6] in reporting four personal cases and 196 recorded cases of malignant lesions of the small bowel, found nine leiomyosarcomas. In 1945, Shallow, Eger and Carty[42] reported a primary adenocarcinoma of the midjejunum and reviewed thirty-eight consecutive histologically proved primary malignant tumors of the small bowel. They made a detailed study of malignant lesions of the intestine among the records of 137,174 general autopsies collected from the literature from 1858 to 1938 and tabulated 5,034 such lesions in the large intestine and 134 in the small

---

Presented before the Minneapolis Surgical Society, October 6, 1955.

intestine. This is an incidence of malignant tumor of the small intestine of 0.1 per cent, about 36 times less frequent than large-intestinal neoplasms. They found that 3 per cent of intestinal carcinomas and 60 per cent of intestinal sarcomas occur in the small intestine. In surveying the incidence and distribution of carcinomas and sarcomas among primary small-intestinal malignant lesions, they tabulated 269 cases, including their own 38. They found 73 carcinomas and 12 sarcomas in the duodenum, 75 carcinomas and 21 sarcomas in the jejunum, and 38 carcinomas and 50 sarcomas in the ileum. They concluded that carcinoma is twice as common as sarcoma in the small intestine and that malignant tumors in general occur with equal frequency in all three divisions of the small intestine, the ileum ranking the lowest for carcinoma but highest for sarcoma.

Detailed discussion of the pathologic features of these tumors is extensively presented elsewhere.[22,24,29,49] They are thought to represent malignant change in a pre-existing leiomyoma. It is stated that 15 to 20 per cent of these myomas become malignant.[3]

Summary of Forty-five Reported Cases*

Age.—The youngest patient was four days old; the oldest seventy-six years. There was one patient in the age group from infancy to ten years, one in group eleven to twenty; one in group twenty-one to thirty; seven in group thirty-one to forty; fifteen in group forty-one to fifty; twelve in group fifty-one to sixty; six in group sixty-one to seventy; two in group seventy-one to eighty.

Sex.—Distribution as to sex was about equal, there being twenty-five male and twenty female patients.

Race.—Two negroes were reported. The remainder were white.

Symptoms and Signs.—The duration of preoperative symptoms varied a great deal. Two patients had had no symptoms whatsoever. One had had symptoms presumably due to the lesion for seventeen years; this man had recurring episodes of severe melena from an ulcerating, bleeding lesion of the jejunum. Abdominal pain of one type or another was noted in thirty-one of the forty-five cases. In eight cases, signs and symptoms of an acute perforating lesion were present; in two more the picture of a slow or chronic performation was seen, with walling off and localization. Obstruction was an occasional clinical feature. In eight cases, it was of an emergent, acute nature, and in eight, the obstruction was chronic and intermittent. A palpable mass was present in seventeen cases. This was usually abdominal, but in two cases it was found on rectal examination and in another on vaginal examination. Gross hemorrhage was a frequent feature, with twenty patients having had intermittent melena varying from massive bright-red bleeding to tarry stools. Anemia was present in nineteen cases and absent in twelve; no mention was made of hematologic data in 14 reports. With the exception of x-ray studies, other laboratory findings were not helpful. Small-bowel x-ray examinations were made in fifteen cases; results in nine were reported as negative. In three cases, a small-bowel tumor was diagnosed. In the three remaining cases, the roentgenologic diagnosis was Meckel's diverticulum. In these cases, the tumors were found at operation to be arising in Meckel's diverticulum. A barium enema disclosed an intussusception in the terminal ileum in one case. This was found at operation to be due to a pedunculated intraluminal tumor as the intussuscipiens.

Diagnosis.—The difficulty in the preoperative diagnosis of these lesions is amply testified to by a mere listing of the preoperative diagnoses given in the case reports. These included acute appendicitis twice, pelvic inflammatory disease and peritonitis, chronic tuberculous peritonitis, intestinal obstruction five times, uterine tumor in three cases, perforated peptic ulcer or perforated viscus in three, bleeding duodenal ulcer in two, Meckel's diverticulum three times, extrarectal mass, ruptured ectopic pregnancy, and peritonitis from a strangulated inguinal hernia. In three of the forty-five cases, a diagnosis of tumor of the small bowel was made, based in each instance on the x-ray findings. In seventeen cases, the preoperative diagnosis was not stated in the report. At first glance, these seem to represent a rather wide variety of diagnoses, but it should not be felt that this represents any lamentable lack of diagnostic acumen. In almost every case, there were perfectly sound and acceptable reasons for the diagnosis that was made. The lesions were quite evenly spread through the small intestine; twenty-one were in the jejunum and twenty-four in the ileum. Of these latter, six occurred in Meckel's diverticulum.

---

*See References 2, 4, 5, 7, 8, 9, 10, 11, 12, 13, 16, 22, 23, 24, 26, 27, 28, 29, 30, 31, 35, 37, 39, 40, 41, 44, 45, 46, 47, 48, 49, 50, 51, 53.

These tumors, arising in the muscle coats of the wall of the intestine, may grow either inward or outward. They do not tend to encircle the bowel wall in an annular fashion as carcinoma does. The majority, the so-called subserous variety, tended to grow into the mesentery, presenting a lobulated bulky appearance, although a few were pedunculated masses attached to the antimesenteric wall. In four cases, the extension was into the lumen of the bowel as a pedunculated or even a papillary growth, the so-called submucous type. The tumors were generally firm; on cross section, they presented a rather fleshy, homogeneous surface with areas of cystic degeneration. Most frequently the color was gray or red; occasionally it was yellow. Ulceration of the mucosa was not uncommon, as would be expected from the incidence of melena. In ten cases, gross perforation of the tumor was noted. A cystic area may have perforated into the general peritoneal cavity or the perforation was directly from the bowel lumen, through the tumor, and thus into the peritoneal cavity. In many cases, small hemorrhages into the substance of the tumors were present, being rather sizable in two instances.

The size of the tumors varied a good deal. The largest was 16x8x9 cm., and the smallest was 2.2x2.5 cm. Size is not necessarily related to prognosis. In one case, the tumor measured 3x2.5 cm. when resected. The patient was dead of massive recurrences 5 years later.

Intussusception was found in two cases. The tumors were small, almost entirely intraluminal and pedunculated. In ten cases, there was either local or distant metastasis or a spread of the tumor to other structures. Metastatic spread was usually by peritoneal implants or liver nodules and only rarely to lymph nodes; in none of these cases was there histologic verification of such nodal metastasis. Because of this, some authors consider that wide resection of tissue containing lymph nodes is probably not necessary.

Prognosis.—Most authors quote Klopp and Crawford[29] as indicating that the tumors are relatively benign and that early resection should afford excellent possibility of a cure. This is not necessarily true.

Postoperative deaths occurred in five cases (11 per cent mortality). In thirteen cases, the patients recovered from the operation but the subsequent course was not given in the report.

Eight patients died of their malignant disease from five months to fifteen years later. All of these patients except one (who survived six and one-half years) had had metastasis or local extension of the disease process at surgery. One patient manifested obvious signs of massive recurrence less than a year after operation. Another patient was alive but with proved metastasis nineteen years after the original operation. Seventeen patients were well and presumably free of their disease from six months to ten years after surgery. Starr and Dockerty, in a series of 41 patients with malignant tumors of this type, found that approximately 50 per cent of the twenty-eight who could be subjected to five-year follow-up survived 5 years or more.

In approaching the question from a different angle, it is found that of the ten patients with metastasis or extension at operation, one died a postoperative death, six died as a direct result of their disease, and three were alive and well at the time of the report, six months, twenty-three months and two years after surgery. Among the thirty-five patients without evident extension or metastasis, there were four postoperative deaths. One patient died of recurrent malignant tumors six and one-half years after surgery, and two were living with evidence of recurrent disease at the time of the reports as already mentioned. The other 14 about whom information was known were living and presumably well, six months to ten years postoperatively.

It is evident that the prognosis in general is only fair. However, an occasional patient lives for an astonishingly long time with known disease, and an attempt at resection should always be made even in the face of an apparently hopeless situation.

Treatment.—In one case, operation had not been done, the report being based on autopsy findings. In all the other cases, some type of surgical procedure was done. In forty cases, primary resection was done. In three of these forty cases in which the tumor had extended to or was adherent to the adjacent colon, resection of colon was done in addition. In two cases, the lesion was locally excised with closure of the opening in the bowel. In the remaining two cases, biopsy of metastatic nodules was done with no resection being carried out.

Specific mention of x-ray therapy was made in only two cases. In one case, a patient with multiple masses in the omentum and visceral and parietal peritoneum, who had had biopsy only, the palpable masses disappeared under therapy only to return in six months, the patient dying two years after the therapy. In the other case, in which a mass was noted five months postoperatively, the gradual enlargement of multiple masses was apparently not influenced and the patient died fourteen months after operation.

Case Reports

Case 1.—R. C., a white housewife, fifty-one years old, was admitted to the hospital for the first time on April 17, 1949, for drainage of a rectal abscess. Besides the complaints related to the abscess, for about one year she had noted attacks of a feeling of fullness in the lower abdomen, accompanied by colicky lower abdominal pain and often relieved by a bowel movement. A number of years before, she had had a diagnosis of duodenal ulcer confirmed by x-ray, and still had occasional mild episodes reminiscent of this disorder. Ten years prior to admission she had had an appendectomy and right oöphorectomy for an ovarian cyst. She had had no menstrual flow for one year until a month prior to admission when she had two days of a slightly sanguineous flow. The past history and systemic inventory were otherwise non-contributory.

Her blood pressure on entry was 146/88; temperature, pulse and respiration were normal. She appeared comfortable and in good health and nutrition. A complete general physical examination was negative except for the following: a typical, quiescent fistula-in-ano; on pelvic examination, the uterus was anterior and mobile and normal in size and shape. The right adnexa were free. In the left adnexa was a rounded mass, approximately 8 x 6 cm., which was felt to be an ovarian cyst.

Hemoglobin was 14.6 gm. per cent; leukocytes 7.500. Routine urine examination was negative. Fluoroscopy showed a normal esophagus and stomach, with a slight deformity of the duodenal cap, which was felt to be secondary to scarring, without evidence of an ulcer crater. There was normal distribution of the meal at four hours.

On April 19, 1949, surgery was performed for the anal fistula, and the patient pursued an uneventful course following this procedure.

On April 26, 1949, abdominal exploration was performed through a low midline incision. The pelvic organs were entirely normal. Further search revealed a deep-red, soft, loculated mass about 8 cm. in diameter in the ileum. The mass involved only a small area of mesenteric border of the bowel wall, and was, in fact, almost entirely mesenteric in location. The lumen of the bowel had been encroached upon only very slightly. Resection of the mass was carried out, including about one foot of ileum and a deep V-shaped segment of mesentery, and an end-to-end anastomosis was performed. There was no gross evidence of regional or distant metastasis.

The pathological report was as follows: "Examination of the specimen showed a segment of small bowel, 29 cm. long, that is not dilated. A nodular, congested, fleshy tumor, 8x6.5x4 cm. arises from the outer surface of the wall of the bowel and the adjacent mesentery; it is attached by an area about 3 cm. in diameter and is pedunculated. The tumor seems to replace the muscle layers of the bowel where it is attached, but is covered on the inside by normal mucosa. Part of the center of the mass is cystic and contains blood clots. The tumor is otherwise fleshy and very soft on section. Microscopically, the tumor is made up of rather closely packed rounded and oval nuclei, with indistinct separation of their cytoplasm. There is moderate variation in nuclear size and an occasional mitotic figure. In some regions the cells become spindle-shaped and strongly suggest smooth-muscle formation. Diagnosis: Leiomyosarcoma of the ileum."

The patient's postoperative course was entirely uneventful, and she left the hospital on May 6, 1949, ten days after her abdominal operation. A course of deep x-ray therapy was given to the lower abdomen immediately postoperatively over a period of twenty-five days.

About one year postoperatively, she began to have indigestion suggestive of gall-bladder disease, and this diagnosis was confirmed by roentgenographic evidence. Surgery was advised, with the thought of removing the gall bladder as well as taking a "second look" at the site of the previously removed tumor. On exploration, the site of the previous intestinal anastomosis and the adjacent mesentery were entirely normal and free of recurrent tumor tissue; however, on careful scrutiny of the omentum, three tiny, hard nodules were found, each measuring 2 mm. in diameter. On microscopic examination, these proved to be recurrences of the tumor. There were no other recurrences found anywhere within the abdomen. The gall bladder contained a number of small stones, and it was removed. The common and hepatic ducts appeared to be normal. Convalescence from this operation was uneventful.

The patient remained well until the fall of 1951 (two and a half years after her first operation) when she developed massive recurrences throughout the abdomen, with right pleural effusion. A further course of x-ray therapy was given at this time without apparent benefit. The patient went very slowly and miserably downhill over the next year and died on December 17, 1952, three and a half years after the original removal of the lesion.

Case 2.—P. S., a white man, fifty-one years old, was admitted to the hospital on December 31, 1948, with a complaint of lower abdominal pain of three days' duration, cramping in nature and temporarily relieved by a bowel movement. His past history was irrelevant except for a hemorrhoidectomy one year previously and the finding of diverticulosis of the sigmoid colon at that time.

The admission temperature was 100.4°F., the pulse 88 and the blood pressure 126/80. The patient appeared acutely ill and complained of severe pain in the left lower abdomen. General physical examination disclosed pronounced left-rectus spasm with severe tenderness which was fairly diffuse throughout the left lower quadrant. Rebound tenderness was elicited in this area. The right side of the abdomen was normal. No masses were made out. Rectal examination was negative. The leukocytes numbered 16,300, with 68 per cent neutrophiles, 24 per cent lymphocytes, 7 per cent monocytes and 1 per cent eosinophiles. Routine urinalysis was essentially negative.

It was felt that the patient had an acute diverticulitis with probable slow perforation. Conservative treatment was elected. The patient was started on a residue-free diet, large doses of penicillin and streptomycin parenterally and sulfasuxidine by mouth. Continuous hot stupes were applied to the abdomen. The next morning continuous nasal suction was instituted.

The patient's course was rather stormy for the first few days The leukocyte count varied between 14.800 and 18.900. At the end of the first week the leukocytes had falled to normal levels and remained so. Urine specimens were normal. A serum amylase determination was normal. Stool examinations and cultures were negative. A flat roentgenogram of the abdomen two days after admission showed a small collection of gas in the peritoneal cavity lateral to the hepatic flexure of the colon, which was felt to be in an abscess. There was no evidence of bowel obstruction.

On the fourth day, the nasal tube was removed and the patient was started on gradually increasing oral intake. Aureomycin had been substituted for the penicillin on the second day. There was some right upper quadrant tenderness as well as that noted on the left side of the abdomen. At the end of the first week, only moderate tenderness persisted. There was considerable malaise and ill-defined abdominal distress. X-rays of the abdomen on the sixth day had shown no evidence of the tiny collection of air previously noted. On the eleventh day x-rays showed a very minute collection of free gas in the right side of the abdomen at the level of the lower margin of the liver. Proctoscopic examination three weeks after admission was negative. The patient left the hospital on the twenty-fourth day free of distress. His only symptoms were moderate asthenia and anorexia.

On February 9, 1949 (seventeen days after discharge and forty days after onset of symptoms) colonic fluoroscopy was done, the following report being made: "Diverticulosis at the juncture of the descending and upper sigmoid colon. There is some irritability of the colon in this area with localized tenderness. The findings are consistent with a subsiding diverticulitis. The appendix is retrocecal but otherwise normal."

After discharge from the hospital, the patient felt well in general, slowly gaining in strength and in appetite. He was relatively free of abdominal symptoms until three months after the first episode when he again noted rather abrupt onset of quite severe sharp pain in the lower abdomen with findings exactly similar to those preceding the previous admission. He was taken to the hospital where a leukocyte count was 12,000 with 8 per cent neutrophiles, 19 per cent lymphocytes. Th neutrophiles showed toxic changes. Flat x-ray film of the abdomen were negative.

The pain increased rapidly. his temperature went t 101 degrees, the abdomen became rigid, and it wa obvious that an acute abdominal condition existed. A diagnosis of a probable perforating diverticulitis wa made and a loop transverse colostomy was done. A that time the entire abdomen was sealed off by wha appeared to be a peritonitis. and no attempt was made to break through these adhesions. Supportive therapy included antibiotics and multiple transfusions of blood. His convalescence was slow. but progressively favorable

About two weeks after dismissal from the hospital, he began to have indications of a localizing process in the right lower quadrant of the abdomen which in about ten days began to "point," and drainage was felt advisable On making a small incision in the area, much foul, purulent material, gas and feculent material were obtained. The incision was enlarged. Instead of an abscess, a large tumor was found occupying an intramesenteric location in the jejunum, involving two loops of intestine. The capsule of the tumor was very thin and had already ruptured. Diverticulitis of the sigmoid colon was present but was obviously not the cause of the situation. Massive resection of the tumor, mesentery and adjacent intestine was done, with end-to-end anastomosis. There was no evident hepatic metastasis or gross implants on the peritoneal surfaces.

The pathologic report was as follows: "55 cm. of small intestine and portion of mesentery. Weight 1300 grams. In the mesentery and arising either from the mesentery or from the muscularis of the small intestine there is a lobulated. poorly encapsulated, necrotic mass measuring 18x18x12 cm. There is no connection between the centrally degenerated portion of the tumor and the lumen of the small intestine, but the lumen of the latter is markedly narrowed at several points. Diagnosis: Leiomyosarcoma of the jejunum."

Because of the likelihood of implants, he was given a course of deep x-ray. The patient's convalescence following this was rapid and free of untoward incident. Operative closure of his calonic stoma was carried out two months later. At this time, it was impossible adequately to explore the entire abdomen. but there was a nodule attached to the epiploic tags of the distal portion of the transverse colon. This was excised, and pathological examination showed it to be a leiomyosarcoma identical with that originally removed.

The patient gradually gained in strength for a short time, but soon multiple masses appeared throughout the abdomen, and he was given a further course of deep x-ray therapy. This appeared to have little, if any. effect on the relentless progression of the disease, and he expired one year from the onset of initial symptoms.

Summary

1. Forty-five cases of leiomyosarcoma of the jejunum and ileum in the literature were studied and are summarized; thirty-one patients (75 per cent) had abdominal pain, twenty (44 per cent)

ad gross hemorrhage, seventeen (38 per cent) ad a palpable mass, sixteen (36 per cent) had ither acute (eight cases) or chronic (eight cases) bstruction and five (22 per cent) had the clini- al picture of a perforating lesion. They are seen t any age, but most frequently in the middle ears. The diagnosis is very difficult, small bowel umor having been diagnosed only three times. 'reatment is surgical resection; apparently the sual wide excision of lymph-node-bearing areas ; not necessary. X-ray therapy holds little romise. Prognosis is very poor where there are ocal extensions or implants and fairly good (per- aps 50 per cent survival) where there are not.

2. Two personal cases of leiomyosarcoma, one f the jejunum and one of the ileum are present- d. The clinical picture in one was that of a very nild intermittent intestinal obstruction with a elvic tumor, and in the other that of a per- orating intra-abdominal lesion.

Comment

Three points concerning the nature of this dis- ase deserve emphasis.

In the first place, the microscopic picture of this tumor is not necessarily an indication as to its degree of malignancy. Indeed, in many cases it will not even indicate whether the tumor is malignant or not. Many pathologists will not render an opinion as to whether this tumor is malignant until metastasis, implantation or direct extension of the tumor appears. Consequently, it is possible that many leiomyosarcomas recorded as being surgically cured undoubtedly could have been benign to start with, which would certainly affect the percentage of cures in the treatment of these tumors.

The second point to be emphasized is the bizarre clinical features that may be present. Symptoms of small-bowel tumors frequently are so obscure that no reason exists to suspect them. For instance, in one of the cases presented, the predominant features of the clinical picture were masked by the presence of diverticulitis and, in retrospect, one probably would have recommended laparotomy at the onset of the first symptoms because suspicion might well have been focused on a small-bowel tumor. This would have been of great therapeutic significance since it would have given an earlier chance of surgical attack. In the other case, likewise, the clinical picture simulated a gynecologic disorder and no suspicion whatever was entertained as to the presence of a small-bowel tumor. This woman's pain was in the left side of the pelvis. Bimanual examination disclosed a mass in the region of the left adnexa. Laparotomy revealed a tumor of the small bowel behind and to the left of the uterus. It had prolapsed into this area and could not be distinguished by examination from a tumor of the ovary.

The last, and probably the most important point, is the value of a second, third or even fourth look into the abdomen in certain cases of malignant disease. This is particularly applicable in leiomyosarcoma of the small bowel. In this rare tumor, spread of the disease is either through the blood stream or by peritoneal implantation. Because spread is practically never to the lymph nodes, adequate surgical excision of the tumor in the absence of hepatic involvement should be sufficient, and dissection of lymph nodes is not necessary. Consequently, when metastasis is not evident and the tumor can be resected, one would be justified in recommending repeated subsequent laparotomies in an attempt to obtain a cure. This principle probably should be applied also in all cases of leiomyomas of the small bowel. Regardless of the fact that these tumors may look microscopically benign, it is well known that they may produce metastasis and implants.

The importance of repeated laparotomies is illustrated in one of our patients. Fifteen months after removal of the original tumor, this woman experienced symptoms typical of gall-bladder disease, and this was substantiated by x-ray findings. Laparotomy was done, with the idea of both removing the gall bladder and taking a second look. After the gall bladder was removed, thorough exploration of the abdomen disclosed the afore-mentioned recurrent tiny nodules of tumor on the greater omentum. In retrospect, it might have been wise to advise a third look six to twelve months after the gall-bladder operation and two and a half years after the original resection with the idea of removing any implants or extensions at that time.

Bibliography

1. Andersen, D. H., and Doob, Elsie: Leiomyosarcoma of the duodenum. Arch. Path., 16:795-802 (Dec.) 1933.
2. Barrett, J. D.: Malignant tumor of Meckel's diverticulum. Brit. J. Surg., 41:518-519 (March) 1954.
3. Bockus, H. L.: Gastroenterology. Philadelphia: W. B. Saunders Co., 1946.

4. Bodenheimer, J. M.: Sarcoma of the small intestines: Case report. Am. J. Surg., 66:404-406 (Dec.) 1944.
5. Brink, J. R., and Laing, G. H.: Leiomyosarcoma of the jejunum. Arch. Path., 15:316-317 (Feb.) 1933.
6. Cameron, A. L.: Primary malignancy of the jejunum and ileum. Ann. Surg., 108:203-220 (Aug.) 1938.
7. Castleman, B.: Editor—Case 39171. Case Records of the Massachusetts General Hospital. New England J. Med., 248:732-736 (Apr. 23) 1953.
8. Cattel, R. B., and Woodbridge, P. D.: Leiomyosarcoma of the jejunum: Postoperative renal suppression treated by paravertebral nerve block. Surg. Clin. North America, 2:363-370 (Apr.) 1931.
9. Chont, L. K.: Sarcomas of the small intestine and reference to their radiosensitivity. Radiology, 36: 86-97 (Jan.) 1941.
10. Cohn, S., Landy, J. A., and Richter, M.: Tumors of the small intestine. Arch. Surg., 39:647-666 (Oct.) 1939.
11. Collins, E. N., and Spencer, F.: Massive hemorrhage (melena) due to leiomyosarcoma of the jejunum: Report of a case. Cleveland Clin. Quart., 14:1-6 (Jan.) 1947.
12. Cullen, T. H.: Leiomyosarcoma of the jejunum presenting as peritonitis. Brit. J. Surg., 37:119-121 (July) 1950.
13. Eckel, J. H.: Primary tumors of the jejunum and ileum. Surgery, 23:466-475 (March) 1948.
14. Ehrlich, J. C., and Hunter, O. B., Jr.: Tumors of the gastrointestinal tract: A survey of 813 in persons of military age in World War II. Surg. Gynec. & Obstet., 85:98-106 (July) 1947.
15. Emmett, J. M., and Dreyfuss, M. D.: Malignant tumors of the small bowel. Ann. Surg., 123:859-865 (May) 1946.
16. Fleming, R. M., and Pearson, J. R.: Leiomyosarcoma of the jejunum. J. Internat. Coll. Surg., 14: 547-553 (Nov.) 1950.
17. Foshee, J. C., and McBride, W. P. L.: Leiomyosarcoma of the duodenum: Report of a case and review of the literature. J.A.M.A., 112:2497-2500 (June 17) 1939.
18. Frank, L. W., Miller, A. J., and Bell, J. C.: Sarcoma of the small intestine: Report of four cases. Ann. Surg., 115:544-565 (Apr.) 1942.
19. Fraser, Kenneth: Malignant tumors of the small intestine: A review of the literature and report of 21 cases. Brit. J. Surg., 32:479-491 (Apr.) 1945.
20. Geschickter, C. F.: Tumors of muscle. Am. J. Cancer, 22:378-410 (Oct.) 1934.
21. Goldberg, S. A.: Unusual neoplasms of the small intestine. Am. J. Clin. Path., 9:516-528 (July) 1939.
22. Golden, T., and Stout, A. P.: Smooth muscle tumors of the gastrointestinal tract and retroperitoneal tissues. Surg. Gynec. & Obstet., 73:784-810 (Dec.) 1941.
23. Goldsmith, R.: Leiomyosarcoma of the jejunum. Ann. Surg., 104:148-151 (July) 1936.
24. Gottlieb, C., and Reitman, N.: Leiomyosarcomata of the small intestine. Am. J. Roentgenol., 41:368-372 (March) 1939.
25. Harrington, S. W., and Ganshorn, J. A.: Leiomyosarcoma of the third portion of the duodenum; Report of case. Proc. Staff Meet. Mayo Clinic, 15:74-76 (Jan. 31) 1940.
26. Hill, F. A., and Janelli, D. E.: Malignant tumors originating in Meckel's diverticulum. Case report of a leiomyosarcoma and review of the literature. Am. J. Surg., 85:525-528 (Apr.) 1953.
27. Janes, H. H., and Taddeo, M. C.: Leiomyosarcoma of jejunum, 17-year history, simulating chronic duodenal ulcer. Ann. Surg., 136:887-892 (Nov.) 1952.
28. Jones, T. E., and Brubaker, R. E.: Leiomyosarcoma of the ileum: Report of a case. Cleveland Clin. Quart., 9:173-177 (Oct.) 1942.
29. Klopp, E. J., and Crawford, B. L.: Leiomyoma of the small intestine. Ann. Surg., 101:726-733 (Feb.) 1935.
30. Lewis, D. L.: Two cases of sarcoma of the small intestine with unusual features. Brit. J. Surg., 26:540-546 (Jan.) 1939.
31. McDermott, J. G.: Leiomyosarcoma of the ileum. Canad. M. A. J., 35:22-23 (July) 1936.
32. McFarland, Joseph: Malignant myoma. Am. J. Cancer, 25:530-543 (Nov.) 1935.
33. Mayo, C. W.: Malignancy of the small intestine. Collect. Papers Mayo Clinic, 32:312-319, 1940.
34. Medinger, F. C.: Malignant tumors of the small intestine: A study of their incidence and diagnostic characteristics. Surg. Gynec. & Obstet., 69:299-305 (Sept.) 1939.
35. Nygaard, K. K., and Walters, W.: Malignant tumors of Meckel's diverticulum: Report of a case of leiomyosarcoma. Arch. Surg., 35:1159-1172 (Dec.) 1937.
36. Rabinovitch, J., Grayzel, D. M., Swyer, A. J., and Pines, B.: Sarcoma of the small and large intestine. Surg. Gynec. & Obstet., 85:333-339 (Sept.) 1947.
37. Ragins, A. B., and Shively, F. L., Jr.: Sarcoma of the small intestine. Am. J. Surg., 47:96-10 (Jan.) 1940.
38. Raiford, T. S.: Tumors of the small intestine Arch. Surg., 25:122-177 and 321-355 (July) 19
39. Rankine, J. A.: Leiomyosarcoma of the small intestine. Canad. M. A. J., 48:415-419 (May) 19
40. Ripstein, C. B., and Flint, G. W.: Leiomyosarco of the small intestine. Surgery, 34:882-885 (No 1950.
41. Roth, D., and Farinacci, C. J.: Jejunal leiomy sarcoma in a newborn. Cancer, 3:1039-1043 (No 1950.
42. Shallow, T. A., Eger, S. A., and Carty, J. E. Primary malignant disease of the small intestine Am. J. Surg., 69:372-383 (Sept.) 1945.
43. Simpson-Smith, A.: Sarcoma of the intestine in children. Brit. J. Surg., 26:429-438 (Oct.) 1938.
44. Siris, I. E.: Malignant tumors of the small intestine. Am. J. Surg., 77:573-584 (May) 1949.
45. Skinner, I. C., and Walters, W.: Leiomyosarcoma of Meckel's diverticulum, with roentgenologic demonstration of the diverticulum: Report of a case. Proc. Staff Meet. Mayo Clinic, 14:102-107 (Feb. 15) 1939.
46. Smith, L. A., Good, C. A., and Gray, H. K.: Tumor of the small intestine as the cause of recurrent melena: Report of two cases. Proc. Staff Meet. Mayo Clinic, 19:117-122 (March 8) 1944
47. Smith, R. S.: Leiomyosarcoma of the jejunum. Am. J. Surg., 84:492-495 (Oct.) 1952.
48. Smith, W. D., and Mullens J. E.: Perforation of Leiomyosarcoma of small intestine presenting as strangulated inguinal hernia. Canad. M. A. J., 72: 373-376 (March) 1955.
49. Starr, G. F., and Dockerty, M. B.: Leiomyomas and leiomyosarcomas of the small intestine. Cancer, 8:101-111 (Jan.-Feb.) 1955.
50. Thomas, Orichejolomi: Myosarcoma of Meckel's diverticulum. Surgery, 32:667-672 (Oct.) 1952.
51. Warren, R. F.: Primary malignant tumors of the small bowel. Canad. M. A. J., 51:451-457 (Nov.) 1944.
52. Weinstein, M. and Roberts, M.: Leiomyosarcoma of the duodenum. Report of a case and summary of the literature. AMA Arch. Surg., 66:318-328 (March) 1953.
53. Widmeyer, R. S., and Mathews, A. R. K.: Leiomyosarcoma of the ileum. West Virginia Med. J., 35:34-37 (Jan.) 1939.

The Clinical Problem of Syphilis Today

HAROLD O. PERRY, M.D.
ROBERT R. KIERLAND, M.D.
THOMAS B. MAGATH, Ph.D., M.D.
Rochester, Minnesota

THE PROBLEM of syphilis today has changed in character from the problem it presented about a decade ago. At that time, the basic facts of diagnosis and epidemiology were recognized and the paramount problems were those of treatment and sterilization of infective foci. With the ntroduction of penicillin as an antisyphilitic drug, hese paramount problems were largely solved, a fact which accounts in no small measure for mproved morbidity rates of syphilis. By no means do we wish to imply that clinical syphilis is no onger a problem with which to deal; we are merely stating the fact that emphasis on the diagnosis and treatment of early syphilis has changed.

Today, the problem of syphilis is chiefly concerned, in the absence of early syphilis, with the evaluation of positive serologic tests for syphilis.* Dermatologists are requested to evaluate such reactions; they are asked to classify them as representative of a syphilitic infection, either active or inactive, or as an apparently nonspecific biologic reaction. With the decrease in the number of cases of syphilis seen, there is an increase in the proportion of these nonspecific reactions. While the ever-increasing refinement and sensitivity of serologic tests have been developed, the specificity of the tests has also been improved. There is some evidence to support the belief that these improvements have altered the ratio of nonspecific tests to specific tests.

In an effort to better appreciate the problem of syphilis today, the records of all patients for whom a positive serologic test for syphilis was obtained at the Mayo Clinic laboratories during the year 1955 were reviewed. The records of 1,559 patients were studied. The results are given in Table I, and the cause for the positive serologic tests as recorded in the history will be discussed.

TABLE I. DISTRIBUTION OF 1,559 PATIENTS IN WHOM SEROLOGIC TESTS FOR SYPHILIS WERE FOUND TO BE POSITIVE DURING 1955

Group	Diagnosis	Patients	
		Number	Per Cent
1	Old syphilis, seen previously at the clinic	378	24.2
2	Previous syphilis, first visit to the clinic	340	21.8
3	Syphilis discovered for first time (1955)	176	11.3
4	Nonspecific reactions	282	18.1
5	Undecided with reference to syphilis	94	6.0
6	No action taken	272	17.5
	Disregarded	15	1.0
	Transfer of reagins	2	0.1
Total		1,559	100.0

A VDRL test was first performed on these patients, followed by a standard Kahn test if the VDRL test was positive. In almost all instances, the patient was returned, either the next day or shortly thereafter, and a battery of tests, consisting of a VDRL test, a standard Kahn, a Hinton, and a Kolmer-Wassermann, was performed. In some cases in which syphilis was suspected or known or if there was some other reason, the battery of four tests was performed at the outset. In view of the fact that the validity of the conclusions in this paper necessarily rests on the accuracy of the tests, it should be noted that the serologic laboratory performing the tests has stood in the top group of serologic laboratories which voluntarily submit to an evaluation study by the Minnesota State Board of Health in conjunction with the serologic laboratory of the United States Public Health Service at Chamblee, Georgia. During the year covered by this paper, the laboratory performed 576 tests on unknown test sera. The results reported by the laboratory were correct in every instance except one. In this instance, a report of a "weakly reactive" Kahn test should

---

Read at the first International Symposium on Venereal Diseases and the Treponematoses, Washington, D. C., May 28 to June 1, 1956.

Dr. Perry and Dr. Kierland are in the Section of Dermatology, and Dr. Magath is in the Section of Clinical Pathology, Mayo Clinic and Mayo Foundation. Rochester, Minnesota.

The Mayo Foundation, Rochester, Minnesota, is a part of the Graduate School of the University of Minnesota.

*It should be understood that the expression "serologic tests for syphilis" is a vernacular expression. It refers to tests performed with an antigen prepared from beef hearts. "Positive" and "negative" results would more correctly be referred to as "reactive" and "nonreactive." If these facts were kept in mind, less confusion would exist with reference to these tests.

TABLE II. THE TYPE OF SYPHILIS PRESENT IN 176 PATIENTS NOT PREVIOUSLY RECOGNIZED AS HAVING THE DISEASE

Type of Syphilis	Patients	
	Number	Per Cent
Latent	129	73.3
Central nervous system	26	14.8
Cardiovascular	6	3.4
Gumma	2	1.1
Optic neuritis	1	0.6
Prenatal	10	5.7
Undetermined	2	1.1
Total	176	100.0

have been reported as a "reactive" Kahn test. Of the eighty-four unknown paired specimens, the correct report was made in every instance.

Data

Patients with positive tests were categorized in one of six groups (Table I). The first group consisted of patients previously seen at the clinic in whom the diagnosis of syphilis had been established at some previous time. They were being seen at this time for follow-up of their syphilis or were referred for follow-up as part of a general examination. In some instances, patients within this group had been observed periodically for twenty-five years or more. There were 378 patients in this group, which we have termed "definite old syphilis of known duration," and they represent 24.2 per cent of the total number of patients studied.

The second large group consisted of those patients (1) in whom a diagnosis of syphilis had been made previously elsewhere, (2) who were seen at the clinic for the first time, and (3) in whom the diagnosis of syphilis was confirmed at the clinic. There were 340 patients (21.8 per cent) in this second group.

The third large group consisted of patients in whom the diagnosis of syphilis was made by us, and for the first time. This group contained 176 patients (11.3 per cent) and included representatives of all stages of the disease except early syphilis (Table II). The patients with latent syphilis and most of those with the late types of syphilis were patients originally registered in a general section of the clinic and were seen by a consultant in the Section of Dermatology because they had a positive blood test on routine testing. In only a few instances were such patients seen first by the dermatologists, and, then, not because the patient knew he had syphilis, but rather that he had some unusual skin disease, the etiology of which was not recognized elsewhere and which had no been amenable to care at home. The divisio of these patients into their respective stages o syphilis was as follows: latent, 73.3 per cent late, 19.9 per cent; prenatal, 5.7 per cent (Tabl II).

The fourth group in Table I consisted of those patients with a positive serologic test for syphili who were considered to have a "biologic false positive" (nonspecific) reaction. The phrase "biologic false positive" is one of the most unfortunate terms to have been applied to any laboratory test. If one eliminates the tests which result in positive readings through faulty technique, incompetent reagents, incompetent technicians and stenographic errors, there is nothing biologically false about positive serologic tests which occur in patients in whom the diagnosis of syphilis cannot be made, from a study either of the history or of their physical findings. These tests are in every sense of the word biologically *true* positive tests. Their meaning is still obscure. They should be termed "syphilitic *false* positives." Patients have been diagnosed by competent dermatologists when first seen as having biologically false (nonspecific) reactions, only to have them return years later when an unquestionable diagnosis of late syphilis has been made. It must therefore be clearly recognized that a certain number of so-called nonspecific reactions, or what we would like to term "biologically *true* positive reactions," occur in patients with syphilis in whom the diagnosis cannot possibly be made. It is possible that some of the newer serologic tests employing antigens made of Treponema pallidum may in time unravel this puzzle. This paper, however, does not deal with this particular problem, important as it certainly is.

It should, however, be noted that whereas there appears to be a certain correlation between positive serologic tests and lupus erythematosus, infectious mononucleosis, certain viral infections and vaccination with cowpox virus, only a relatively small percentage of patients with these conditions (except acute systemic lupus erythematosus) exhibit positive serologic reactions.

There are also a number of so-called nonspecific reactions which occur in patients with other diseases, such as malignant lesions, upper respiratory infections and arthritis. One must not forget, however, that the vast majority of patients with these diseases do not exhibit positive erologic reactions and by no statistical connivance can one show a positive correlation between non-pecific reactions and these diseases. Certainly, o prove that these diseases cause positive serologic eactions will take a large volume of data, so ar absent from the literature.

Two hundred and eighty-two patients were classified as having nonspecific reactions and accounted for 18.1 per cent of the 1,559 patients n whom positive reactions were observed. Within his group were included only those patients in whom the nonspecificity of the test was recognized at the time the patient was seen. This fact was recorded in the history but was not always stated on the patient's chart. Table III gives the supposed causes of the nonspecific reactions seen among this group of 282 patients.

It should be pointed out that there are undoubted cases of syphilis in our series in which only one of a battery of tests was positive. In such cases, the clinician must exercise his keenest acumen. Old "burned-out" cases of syphilis and treated patients not infrequently display such inconclusive results in serologic tests.

The next group in Table I consisted of ninety-four patients (6.0 per cent) in whom we could not decide whether the positive serologic test represented a specific reaction for syphilis or a nonspecific reaction. On the one hand, we could not establish a diagnosis of syphilis by the usual means of a history, signs and symptoms; nor could the reverse be proved, that a cause other than syphilis existed to account for the nonspecific reaction. It was within this group that additional follow-up was suggested and the patient was asked to return, or the referring physician was advised of the situation. Because of the time element concerned with repeated serologic tests at intervals, the eventual diagnosis of some of these patients has not been reached. If a patient initially seen had an unexplained positive serologic test and subsequent follow-up indicated that this was a nonspecific reaction, that patient is included with the previous group of nonspecific reactors.

The sixth large group of patients in Table I includes those whose serologic tests for syphilis were positive, but on whom the clinician took no definite action. Included are a considerable number of patients with weakly positive serologic tests for syphilis, the occurrence being mentioned by the clinician, but apparently considered of no significance to the patient. There was a group of patients included with positive serologic tests for syphilis, who had a serious systemic disease, in most instances a malignant lesion. Included in this group were patients in the older age groups (that is, more than sixty years of age) whose positive tests were disregarded, because of age and lack of objective findings for syphilis. There was also a small group of patients with strongly positive serologic tests for syphilis, who, it appears on study of their records at this time, may indeed have had syphilis. Two hundred and seventy-two patients (17.5 per cent) are included in the sixth group.

TABLE III. THE SUGGESTED CAUSE OF THE POSITIVE SEROLOGIC TESTS OR CONDITION PRESENT IN 282 PATIENTS WITH NONSPECIFIC REACTIONS

Diagnosis	Patients	
	Number	Per Cent
Lupus erythematosus, systemic	35	12.4
Lupus erythematosus, discoid	4	1.4
"L.E." apresoline reactions	2	0.7
Virus infections (smallpox vaccination, varicella, and herpes simplex)	21	7.4
Malignant lesions	15	5.3
Upper respiratory infections	14	5.0
Arthritis	11	3.9
Infectious mononucleosis	1	0.4
Undecided	179	63.5
Total	282	100.0

There was a small group, fifteen patients, with advanced age in whom a positive serologic test was found for the first time. It was considered that because of their advanced age without a history of syphilis and without the clinical signs and symptoms of the disease, it was not worth while to spend time or put them to the expense of running a battery of serologic tests to establish the presence of a disease that would have no clinical significance.

In two infants, the positive serologic test was due to transfer of reagins.

Comment

Syphilis as a disease to be considered in differential diagnosis is receiving less and less attention. This trend is due primarily to the results of efforts of physicians and public health officials in the eradication of this formerly prevalent disease. While a tremendous reduction in the incidence of syphilis has taken place, the disease is by no means eradicated and physicians and public health officials must be ever alert to the possibility that syphilis may still produce disability, financial ruin, dementia, and death.

Some idea of the reduction in the incidence of syphilis together with its more serious manifestations may be gained from the figures of Barnouw and Clark,[1] who cited the following achievements of penicillin therapy. The mortality rate from syphilis has dropped from 11.1 per 100,000 population in 1939 to 3.7 per 100,000 in 1952; the infant mortality rate from syphilis has dropped from 0.57 per 1,000 live births in 1939 to 0.02 per 1,000 live births in 1952; the admission rate of the syphilitic insane to mental institutions has dropped from 6.6 per 100,000 population in 1939 to 2.1 per 100,000 in 1951.

Beerman and associates,[2] in their review of syphilis recently published, take cognizance of the foregoing facts, and in addition review all recent advances in the field of syphilology. We would agree with them that syphilis no longer plays a dominant role in clinical medicine. Yet, because of the infrequency of seeing clinical syphilis, the diagnosis of syphilis is omitted from consideration in the differential diagnosis of patients with obscure signs and symptoms.

Of the 1,559 patients at the clinic whose records were reviewed in the present paper, 894 were definitely diagnosed as having syphilis. When the records at this time of writing are considered, it seems apparent that an additional thirty-five patients not previously classified had the disease. These two groups accounted for 59.6 per cent of the total number studied. However, since a decision was reached with reference to syphilis in only 1,178 of the 1,559 patients, actually 79 per cent of those with positive serologic tests were diagnosed as being syphilitic.

The 176 patients of Group 3 were recognized for the first time as having syphilis. We do not wish to discuss the value of routine blood testing to discover this reservoir of undiscovered syphilis, since this subject has been adequately discussed elsewhere.[3] The total of 929 patients diagnosed as syphilitic represents 0.6 per cent of the total clinic patients seen in 1955.

The patients whose positive tests represent a nonspecific reaction (Group 4) account for a substantial proportion of the patients in our series It should be observed that, in many of these patients, our battery of tests revealed only one test or sometimes two tests as being but weakly positive. Such tests are extremely difficult to evaluate. Whether these tests should be included at all in a series of even "nonspecific reactions" could well be debated. The recent article of Beerman and associates[2] emphasized the need for the clinician to be aware of the causes of such reactions. It has been our frequent experience that the finding of a positive serologic test for syphilis in a young adult woman with no history of an actual syphilitic infection may be taken as a premonitory sign of systemic lupus erythematosus. A number of references on this subject of nonspecific reactions are included in the article by Beerman and associates.[2]

Our method of deciding that positive serologic tests at any one time represented specific infection consisted of a review of the patient's medical history in an effort to discover diseases that might account for the positive serologic tests. General and neurologic examinations were performed. It was necessary to follow the serologic tests at monthly intervals. However, sometimes a three-month period elapsed before the test was rechecked. In the absence of definite evidence of syphilis and the presence of tests which were rapidly reverting to, or had become, normal in a few months, a diagnosis of a nonspecific reaction was made. Since the *Treponema* immobilization test and the other more specific tests were not available for routine use in these patients, the decision that a reaction was nonspecific had to be made without the benefit of these laboratory aids.

Although we cannot say that the nonspecific reactions are the most important among the group of positive tests observed certainly they are the ones which hold the clinician's interest because of the desire to discover the presence of some other systemic disease. Their relative importance can be appreciated from a numerical standpoint when it is realized that we observed nonspecific biologic reactions in 282 patients, in comparison to positive tests in 929 patients in whom syphilis was diagnosed. However significant nonspecific reactions may be, it is still important to realize that in most instances a positive serologic reaction indicates syphilis.

Time was the factor which made it impossible for us to decide whether some patients in Group 4 should actually be a part of Group 3. Among patients who live in close proximity to the clinic, this will be accomplished by subsequent follow-ups. In many, however, the patient could not return, so that the responsibility of evaluating the patient was left in the hands of the referring phycician. In our tables, however, patients in this category are classified as not being diagnosed (Group 5). The *Treponema* immobilization test or some other more specific test might have been of value in these cases.

The figures which have been presented, being from a clinic practice in which most patients travel some distance for care, cannot be compared with a more local type of practice. For instance, we did not see a single case of early syphilis during the year 1955, a situation which, although typical for our practice during the past five years, would be unusual in a larger metropolitan area.

Appended are the short histories of five patients recently observed, who illustrate some of the problems seen in syphilis today.

Report of Cases

Case 1. Early Syphilis.—A nineteen-year-old single man came to the clinic during June, 1954, because of a persistent sore throat and "glands" in the neck, axillae, and groins of two months' duration. Only incidentally did he wish anything done for an asymptomatic eruption of his palms and soles that had been present for two and one-half months.

He was referred to the Section of Dermatology for evaluation of his skin, where the barely perceptible rose-pink macules and maculopapules of the palms and soles were seen. Some of the lesions presented small puncta centrally. In addition, there was a moth-eaten appearance to the fringe areas of the hair, rather marked pharyngeal injection with hoarseness, and generalized lymphadenopathy. There was no history of a primary lesion despite adequate exposures. His serologic tests for syphilis were reported as positive.

The patient was given 6,400,000 units of penicillin intramuscularly in divided doses for ten days. Within forty-eight hours, the throat was asymptomatic and the lesions of the palms and soles had faded. After a week of treatment, hyperpigmentation was noted at the sites of the previous skin lesions.

A recheck of the patient's condition eighteen months later revealed the serologic reactions to be negative and the cerebrospinal fluid normal.

Case 2. Late Cutaneous Syphiloderm.—A sixty-year-old divorced woman presented herself at the clinic during November, 1954, requesting treatment for "varicose veins" of the legs and arms. For twenty years this patient had experienced tender erythematous nodules and plaques of the left leg and arm, which would ulcerate for nine to twelve months and then heal with superficial scar formation.

With the onset of the skin lesions, she had polyarthritis characterized by red, swollen, painful wrists, ankles and knees. Most severely involved was the left knee, with subsequent involvement of the left hip. With the extension of the skin lesions about the left knee, stiffness of this joint occurred and the patient walked with a limp. Deformity of the ankle subsequently occurred and progressed so that when the patient was seen at the clinic she had difficulty in walking with the aid of crutches. She denied ever having had syphilis.

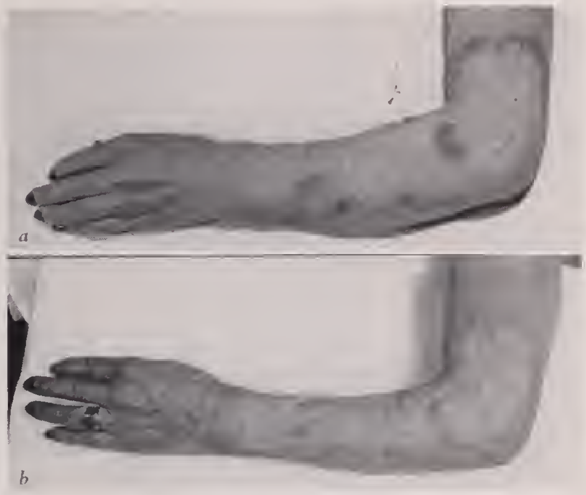


Fig. 1 (Case 2). Cutaneous syphiloderm. (*a*) Before treatment. (*b*) Healed lesions three months after treatment totaling 12,400,000 units of penicillin.

Her examination revealed almost circumferential cutaneous granulomatous processes of the left leg from the ankle to the hip and of the left arm from the wrist to the mid-upper arm (Fig. 1*a*). A plaque, 12 cm. in diameter, was present over the lateral surface of the right upper arm. Dusky-red nodules 0.5 to 3 cm. in diameter coalesced to form arcs and annular plaques, which studded the periphery of the involved areas. Some of the nodules had ulcerated, and adherent ostraceous crusts were present. More centrally in location where the process had resolved, the skin and subcutaneous tissue had atrophied.

Involvement of the deeper structures of the left leg resulted in a peroneal and anterior tibial palsy with contractions of the gastrocnemius and posterior tibial tendons that pulled the foot and ankle into the severe fixed equinovarus position. Complete extension of the knee was impossible.

The patient's serologic reactions for syphilis were positive, and the cerebrospinal fluid examinations were negative. The diagnosis of an ulceronodular syphiloderm was made, and was confirmed by the histopathologic pattern at biopsy of a specimen of skin.

Treatment was instituted with penicillin, 12,400,000 units being administered intramuscularly in divided doses over a twenty-day period. Involution of the skin lesions occurred promptly (Fig. 1*b*). During this time, operation was performed for correction of the foot deformity.

Case 3. Late Syphilis Involving Skin, Bone, and Eye.—A fifty-two-year-old woman came to the clinic in June, 1955, for a skin condition, which had been present for twenty years, and blurred vision of the left eye, which had been present for six weeks.

Her skin problem had begun in 1935, when superficial erythematous scaling plaques, 2 to 3 cm. in diameter, developed over the nose. These plaques would persist for six to eight months and then resolve with superficial scar formation. Similar lesions had appeared on the rest of the body within the past year. Beginning in 1948, the patient had intermittent pain in both feet relieved by adequate rest and supportive boots. The patient readily gave a history of inadequately treated primary syphilis in 1918, when she had been fifteen years of age.

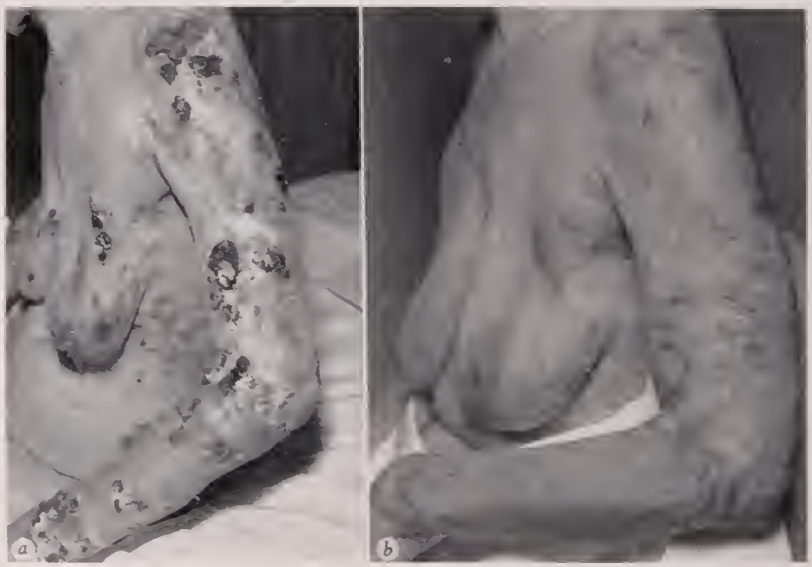


Fig. 2 (Case 3). Ulceronodular syphiloderm. (*a*) Before treatment. (*b*) Six months after 10.600.000 units of penicillin.

On admission, she presented a generalized eruption, most marked on the extremities. The eruption consisted of plaques with irregularly scalloped erythematous nodular borders. The central area of these plaques showed thin atrophic scars, the sequelae of lesions that had involuted. Ulcerations were present, some involving the scar tissue and others the nodules (Fig. 2*a*).

Examination of the left eye showed uveitis characterized by an irregular fixed pupil, a cloudy cornea, and keratotic precipitates on the endothelium. Roentgenograms of the feet showed osteoporosis, gummatous involvement and destructive changes in the bones such as are found in syphilis. Her serologic tests for syphilis were positive. The Kolmer test on the cerebrospinal fluid was positive, but the fluid otherwise was normal.

A diagnosis of late cutaneous, osseous and ocular syphilis was made. After the patient was prepared with bismuth, 10,600,000 units of penicillin were administered intramuscularly in divided doses over a twelve-day period.

When the patient was seen for recheck six months later there was healing in all systems (Fig. 2*b*). A second course of 10,000,000 units of penicillin was given over a ten-day period.

Case 4. Tabes Dorsalis.—A fifty-seven-year-old man was admitted in September, 1954, complaining of increased difficulty in walking and keeping his balance, especially in the dark, which had been present for six months, numbness of the legs for several weeks, and urinary retention during the past fourteen days.

He had previously been seen in 1925, when he was twenty-seven years of age. At that time a diagnosis of early central nervous system syphilis had been made on the basis of a positive serologic test for syphilis and an increased cell count in the cerebrospinal fluid. He had had a primary lesion of syphilis in 1919. The patient did not complete the treatment recommended nor did he respond to follow-up inquiries.

Physical examination revealed a well-nourished man, past middle age, unable to walk and unable to stand without support. He had Argyll Robertson pupils, absent patellar and Achilles tendon reflexes, loss of testicular and Achilles tendon pain, loss of vibratory sense of the legs and a positive Romberg test.

The patient's serologic tests for syphilis were positive, and the cerebrospinal fluid examination showed a positive Kolmer reaction and an elevated protein and cell count.

The patient was given 12,000,000 units of penicillin intramuscularly over a thirty-day period. Recheck of this patient six months later showed that there had been no essential changes in his clinical or serologic condition, but his cerebrospinal fluid had become inactive.

Case 5. Gumma.—A fifty-four-year-old man had had an ulceration of the right side of the soft palate for three months before he was seen at the clinic in May, 1955, for a questionable malignant lesion.

Because routine VDRL and Kahn tests were positive, the patient was referred to the Section of Dermatology for evaluation. He denied knowledge of ever having had any venereal disease.

(*Continued on Page 736*)

Now Available

7 Years Sickness Benefits

(HOUSE CONFINEMENT NOT REQUIRED)

Lifetime Accident Benefits

This extension of benefits is now available to you as a member of the Minnesota State Medical Association. Since December, *1947,* the inception date of our plan for members of your Association, the Caswell-Ross Agency has attempted at all times to secure for you the finest coverage in the accident and sickness field. This long term coverage makes this plan one of the best available today. Why not write or call us about it now?

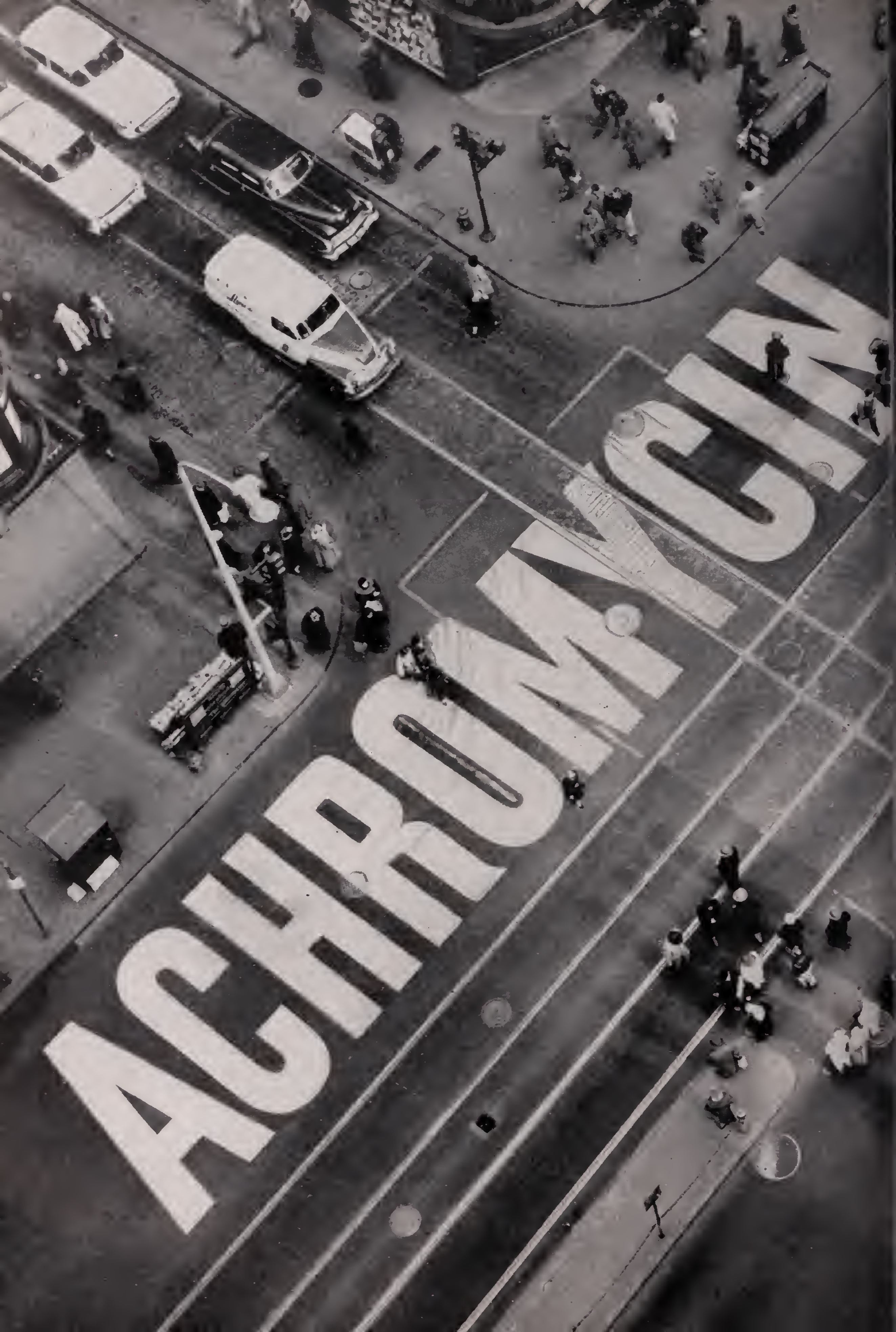
CR
AGENCY
Minneapolis

CASWELL-ROSS AGENCY

1177 N. W. Bank Building Minneapolis 2, Minnesota
Telephone FE 3-5388

Administrators of Professional Disability Plans

Minnesota State Bar Association
Minnesota State Dental Association
Minnesota Society of C. P. A.
Minnesota State Pharmaceutical Assn.
Minnesota Auto Dealers Association
Minnesota Federation of Eng. Societies
Minnesota State Veterinary Medical Soc.
Hennepin County Medical Society
Hennepin County Bar Association
11th Judicial Bar Association
Minneapolis Association of Life Underwriters
Minnesota State Life Underwriters Assn., Inc.
Ramsey County Medical Society
Ramsey County Bar Association
St. Paul District Dental Soc.
Minneapolis District Dental Soc.
St. Cloud Dental and Stearns County Medical Society
Duluth District Dental Society
East Central Medical Society
St. Louis County Medical Society
West Central Dist. Dental Society
Northwest Proprietors Association
St. Paul Life Underwriters, Inc.


ACHROMYCIN

ACHROMYCIN*

Tetracycline *Lederle*

for prophylaxis and treatment of

obstetric infections

Posner and his colleagues[1] have reported on the use of tetracycline (ACHROMYCIN) in 96 cases of obstetric complications, including unsterile delivery, premature rupture of the membranes, endometritis, parametritis, and other conditions. They conclude that this antibiotic is ideally suited for these uses.

Other investigators have shown ACHROMYCIN to be equally useful in surgery and gynecology and virtually every other field of medicine. This outstanding antibiotic is effective against a wide variety of infections. It diffuses and penetrates rapidly to provide prompt control of infection. Side effects, if any, are negligible.

Every gram of ACHROMYCIN is made in Lederle's own laboratories and offered *only* under the Lederle label—your assurance of quality. It is available in a *complete* line of dosage forms, including

ACHROMYCIN SF

ACHROMYCIN with STRESS FORMULA VITAMINS. Attacks the infection, bolsters the patient's natural defenses, thereby speeds recovery. Especially useful in severe or prolonged illness. Stress formula as suggested by the National Research Council.

SF Capsules, 250 mg.
SF Oral Suspension, 125 mg. per teaspoonful (5 cc.)

For more rapid and complete absorption. Offered only by Lederle!

dry-filled sealed capsules

[1] Posner, A. C., *et al.;* Further Observations on the Use of Tetracycline Hydrochloride in Prophylaxis and Treatment of Obstetric Infections, *Antibiotics Annual* 1954-55, pp. 594-598.

Lederle

LEDERLE LABORATORIES DIVISION
AMERICAN CYANAMID COMPANY
PEARL RIVER, NEW YORK

*REG. U.S. PAT. OFF.

PHOTO DATA: SPEED GRAPHIC CAMERA,
F.16, 1/50 SEC., ROYAL PAN FILM

for your complete insurance needs . . .

☆ **PROFESSIONAL**
☆ **PERSONAL**
☆ **PROPERTY**

CHOICE OF THE MINNESOTA MEDICAL ASSOCIATION FOR PROFESSIONAL LIABILITY INSURANCE

THERE IS A ST PAUL AGENT IN YOUR COMMUNITY AS CLOSE AS YOUR PHONE

HOME OFFICE
111 West Fifth Street
Saint Paul 2, Minnesota

The St. Paul Companies
INSURANCE
LAND • SEA • AIR
FOUNDED 1853

St. Paul Fire and Marine Insurance Co.
St. Paul Mercury Insurance Co.
St. Paul Mercury Indemnity Co.

New STEELINE Pediatric Table

Eases the burden of the physician's daily work

Includes built-in tare balance scale, built-in measuring rod, foam rubber cushion and electrical outlets with cord and plug—there are no accessories to buy. Top quality construction features include all-welded steel body, two roomy drawers and a large open compartment with shelf, providing easy, unhampered access to instruments and supplies. Front edge is protected from wear by a stainless steel baffle plate. Despite the fact that this new table has been designed to provide the physician with the best modern equipment, efficient modern production methods in our own factory permit us to keep the price well below that of comparable models. Write today for complete information.

Value

a. s. aloe company OF MINNESOTA
927 Portland Avenue, Minneapolis 4, Minn. • Phone:

Testicular Tumor

Metastatic from Hypernephroma

JOSEPH E. TWIDWELL, M.D.,
GEORGE L. GARSKE, M.D.
Minneapolis, Minnesota

RENAL tumors, despite all that has been written, still prove to be problems taxing the diagnostic acumen and skill of even the most experienced urologist. Deming[6] refers to them as "an enigma and a challenge." Creevy[5] states that malignant renal tumors should be classed with syphilis and tuberculosis as among the great mimics encountered in clinical medicine. By direct pressure, by necrosis or hemorrhage, by extension or by metastasis, they can reproduce clinical appearances of an amazing variety of disorders. This fact is often mentioned but rarely emphasized in discussions of renal neoplasms. A review of the types and methods of metastasis seems necessary to explain some of the bizarre manifestations presented by renal tumors and their metastases.

Renal neoplasms and their metastases have simulated such a large and unrelated variety of disorders that an orderly classification is difficult. For convenience, the following arrangements have been employed:

1. Metastasis to the osseous system.
2. Metastasis to the lungs and pleura.
3. Metastasis to the digestive tract.
4. Metastasis to the female genitalia.
5. Metastasis to the neck.
6. Metastasis to the skin.
7. Metastasis to the central nervous system.
8. Metastasis causing anemia.
9. Metastasis causing fever.
10. Metastasis simulating other disorders of the urinary tract. The osseous system is most involved.

The methods of metastasis of malignant growths are several[7]:

1. Extension to secondary site by continuous extension.
2. Implantation or transfer of malignant cells by contact is infrequent, but does occur on occasion, such as kissing, malignancies of the anterior and posterior walls of the stomach, vulva and bladder.
3. Spread by lymphatic chain is a very important route, particularly for carcinoma. It is less common for sarcoma to metastasize in this fashion.
4. The blood stream is the most frequent route for spread by sarcomata. This is true because this type of growth has the unusual structure of thin blood vessels and naked blood sinuses with a tendency to necrosis and hemorrhage rather than fibrosis. Ewing explains blood vessel metastasis as follows:
   - (a) By direct vessel invasion and spread along the vessels.
   - (b) Secondary and interstitiary embolism.
   - (c) Retrograde transport.
   - (d) Paradoxical embolism (intracardiac communication of the right and left sides of the heart, thus bypassing the lungs).
   - (e) Passage of the thoracic duct which joins the large veins of the neck and upper thorax.

Hypernephroma, however, does not follow the general rule of carcinomata with spread via the lymphatic system. It is characteristic of hypernephroma to metastasize via the blood stream. McDonald and Priestly,[9] in a series of 509 cases, found malignant thrombosis of the renal vein to be present in 54 per cent of the cases of hypernephroma. Therefore, it is quite simple to understand the usual metastasis to the lungs.

Metastatic lesions which appear to have bypassed the lungs are another problem, however, and mechanisms responsible for this will be discussed later.

Nomenclature

Considerable confusion and disagreement exists as to histologic types of renal tumor. A great number of classifications have been reported in the literature. The following from Bell[3] seems to be the simplest and yet all-inclusive.

A. Connective tissue tumors
   1. Fibroma
      (a) cortical
      (a) medullary
   2. Lipoma
   3. Leiomyoma
   4. Hemangioma
   5. Tumor associated with tuberous sclerosis
   6. Sarcoma

From the Department of Urology, St. Mary's Hospital, Minneapolis, Minnesota.

Read at the annual meeting of the North Central Section of the American Urological Association, Chicago, Illinois, September 28, 1955.

B. Epithelial Tumors
  1. Adenoma
    (a) papillary cystadenoma
    (b) solid adenoma (small hypernephroma)
  2. Adenocarcinoma (hypernephroma)
C. Wilms' tumors
D. Tumors of the renal pelvis

For purposes of the scope of this paper and of simplicity, the connective tissue tumors will not be discussed further. They are rare, or are so small as to produce no symptoms, and, with the exception of the sarcomas, do not metastasize.

The majority of cystadenomas are quite small, usually occur near or at the surface of the renal cortex, and are usually seen in older individuals. These tumors occur in cortical scars subsequent to sclerotic closure of terminal renal arteries. When remaining segments of tubules develop collateral blood supply they may progress to form cysts which may develop papillary intracystic processes. The lining epithelium is composed of dark cuboid cells, but occasional cells may have clear cytoplasm. These tumors are probably not malignant, but rarely may produce symptoms due to size. Solid adenomas are small yellow or white circumscribed tumors composed of solid cords of cells with cytoplasm varying from clear to dark. Mitoses are not common, but the tumor structurally resembles the adenocarcinoma, and probably represents the early stage of the more malignant lesion. Reports of metastases occurring from small lesions in the kidney seem to support this view.

Adenocarcinomas are spherical masses occurring in any location, usually in the cortex. The cut section varies from yellow to white with areas of hemorrhage, especially in the larger lesions, the so-called "variegated tumor" on cut section. These tumors may extend locally to involve all or a portion of the kidney parenchyma and the renal pedicle. Extension into the renal vein is common. Miscroscopically, the tumor may be composed of cells varying from clear to dark, and arranged as solid alveoli, papillary cysts or tubules. Highly undifferentiated dark cells with no definite arrangement may be found, and represent a more malignant lesion.

Wilms' tumors are large, rapidly-growing tumors which infiltrate quickly and metastasize widely. Microscopically, the tumor is composed of epithelial and connective tissue elements. One may find stages varying from solid mesenchymal tissue to completely differenated tubules. In addition, areas of striated muscle, smooth muscle and cartilage are found.

Tumors of the renal pelvis, papillomas, are cauliflower-like growths occurring in calyces or renal pelves and attached to the mucosa by narrow pedicles. Microscopically, they are composed of fronds of well-differentiated transitional epithelium with infrequent or no mitoses. Papillary carcinomas have broad bases, and microscopically show evidence of mitotic activity and varying numbers of undifferentiated cells. Squamous cell carcinoma is a sessile lesion which microscopically shows cords and masses of transitional cells with evidence of cornification and keratinization.

Symptoms

This paper is concerned chiefly with hypernephroma and when one thinks of hypernephroma, he immediately recalls the "classic triad" of hematuria, pain, and a mass. The incidence of intermittent grossly bloody urine in carcinoma of the renal parenchyma varies from approximately 15 to 85 per cent, with most figures between 60 to 65 per cent.[7] Mechanisms by which the tumor produces hematuria are actual tumor invasion of the renal pelvis or calyces and/or congestion of pelvic vessels due to tumor pressure. Hematuria is a relatively early symptom, usually painless, appearing occasionally only once, and frequently noted in an observant apparently healthy individual. Other signs and symptoms may not appear for several months or years. Pain, the second component of the classic triad, frequently is the initial symptom, or may occur with bleeding, and occurs in from 40 to 80 per cent of cases. This pain is usually indefinite, dull in character, situated in the flanks or upper abdomen of the affected side, and due to tension on the capsule of the kidney by the increase in size, pressure on nearby structures, pull on the renal pedicle by the kidney, hemorrhage or displacement by the mass. Pain less often may be colicky in type when hematuria with clots occurs. Presence of a mass, the third characteristic, varies considerably and is usually a late and very poor prognostic sign. Other symptoms consist of anorexia, fatigability, weight loss, and low-grade fever. Creevy[5] has emphasized the frequent presence of fever as an early symptom. Metastatic lesions may be the first indication that a renal neoplasm is present. Such tumors may metastasize early and widely as demonstrated by Bandler's[1] report of a patient with a testicular tumor considered pathologically to be a rare primary tumor, and which antedated the presence of a diagnosed renal tumor by two years with negative pyelograms at the time of orchiectomy. Estimates of the frequency with which metastatic lesions are the first presenting symptoms range from 9 to 50 per cent in various series.

Conditions Responsible for Confusion

First among these is the tendency of such a neoplasm to grow slowly and silently for many years prior to symptoms. Several instances of the presence of a tumor for ten to twenty years have been recorded. Further evidence of the slow growth of malignant renal neoplasms has been found in a number of patients in whom the metastasis was found years after the original tumor has been removed. Secondly, usually no local symptoms are produced until the renal pelvis, its capsule or adjacent organs are invaded. This tendency to slow progressive invasion is important in view of the location of the kidney, since a malignant renal neoplasm may simulate a primary lesion of the bowel, stomach, biliary tract, pancreas or spleen. A third characteristic often confusing is the extensive manner in which the tumor may metastasize. This can occur by antegrade, or retrograde, spread by way of venous and/or lymphatic systems. Therefore, metastases from these neoplasms have been found in every organ of the body. Batson[2] demonstrated a logical and anatomic route by which such metastases can occur. In an attempt to explain some of the paradoxic metastases which occur, Batson injected radio-opaque media in the dorsal vein of the penis in cadavers and in monkeys. Based on the conclusions of these experiments, a new concept developed, that of a vast intercommunicating system of veins investing the vertebral column, the sacrum and the adjacent wings of the ilia. This system of veins is characterized by thin walls, low pressure, absence of valves, and communications with renal, portal and caval circulations. Any increase in intra-abdominal pressure such as occurs in coughing, straining or lifting, will reverse the flow of blood in this system, and dislodge tumor emboli, producing paradoxic metastases which bypass the pulmonary, portal and caval circulations. Long and Black have reported the case of a solitary thyroid metastatic implant from a hypernephroma and explain this by applying Batson's theory (from Bandler[1]).

Hollingshead and McFarlane[8] have produced conditions similar to those existing when tumor emboli occlude the renal vein. Wrapping the renal vein in dogs with cellophane tape produces a gradual fibrosis and resultant constriction of the lumen of the vein. Subsequent to this, dilated local venous channels appear in the perirenal fat as collateral circulation. The collateral circulation which develops conducts blood from the kidney through enlarged subcapsular veins and then to the capsular veins in the perirenal fat. The capsular veins communicate with the adrenal, ovarian or internal spermatic, lumbar and ureteric veins. Tumor emboli may travel along any of these dilated channels in a retrograde manner and produce metastases in any region drained by these vessels. This is the mechanism which undoubtedly accounts for the unusual metastasis demonstrated in the case report presented below.

Pyelographic Appearance

Pyelographic appearance of neoplasm[1] may show:

1. Enlargement or irregularity, or both, of the renal outline.
2. Elongation of one or more calyces, with an abnormal termination.
3. Narrowing or complete obliteration of a calyx or group of calyces.
4. Encroachment on the pelvis to cause flattening, elongation, narrowing, irregular filling defects or complete obliteration.
5. Deformity or complete occlusion of the ureteropelvic junction.
6. Secondary pyelectasis.
7. Calcification.
8. Abnormal position of the renal pelvis.
9. Complete disruption of the gross architectural composition of the kidney.

Conditions Simulated by Renal Neoplasm

The problem of differential diagnosis can at times be extremely difficult, for any of the following lesions can produce changes simulating a renal neoplasm:

1. Extrarenal tumors (intra-abdominal)
2. Retroperitoneal tumors
3. Hydronephrosis
4. Tuberculosis of the kidney
5. Pancreatic cysts
6. Mesenteric cysts
7. Splenomegaly and splenic cysts
8. Hepatomegaly and liver cysts
9. Hydrops of the gall bladder

Lateral and oblique roentgenograms and views taken with the patient in Trendelenburg and in upright positions may be useful in arriving at the correct diagnosis. Aortography and presacral air injection are additional procedures sometimes helpful. At times, surgical exploration may be the only definite method of determining the true nature of the problem.

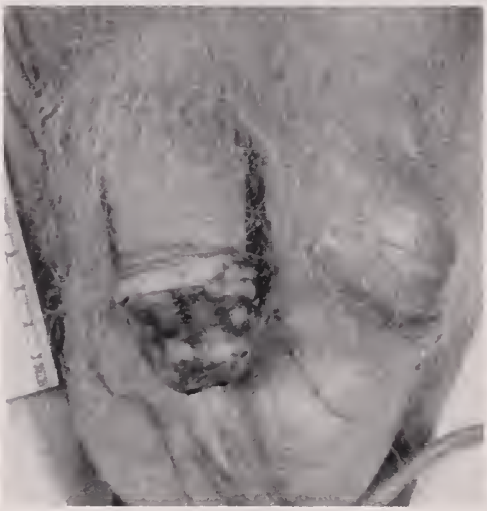


Fig. 1. Gross appearance of tumor nodule in left hemi-scrotum superior to left hydrocele.

Case Report

A. P., aged seventy-six, was admitted to the hospital on March 3, 1955. Thirty years previously he had had surgical treatment for a left hydrocele, which recurred in October, 1954. He consulted his family physician concerning the hydrocele three months prior to admission, and was told he should have surgical removal of a left testicular tumor, but the advice was disregarded. Minimal nonprogressive vesical neck obstruction symptoms secondary to benign prostatic hyperplasia had been present for one year prior to admission. Intermittent gross total painless hematuria developed two to three weeks before admission. He had no known chills or fever. One episode of acute urinary retention just prior to admission was relieved by catheterization. The patient's main complaint was difficulty in walking or sitting with comfort because of the presence of a large scrotal mass.

Physical examination revealed an alert, emaciated elderly white man. Head and neck were normal. Full dentures were present. Auscultation of the chest revealed fine moist rales at both bases. The heart tones were of good quality with no irregularities or murmurs present. Inspection of the abdomen showed an enlarged venous tree in the suprapubic region. No definite masses or tenderness were noted, but an indefinite fullness suggested the possibility of free fluid. Bilateral inguinal herniae were present. Enlarged inguinal nodes were palpable bilaterally. A large hydrocele 15 cm. in diameter was present in the left scrotum, with a hard tumor measuring 4 x 6 cm. above the hydrocele (Fig. 1). The left testicle could not be definitely found. The spermatic cord was anterior, enlarged to 3 centimeters in diameter and firm. No varicocele was found. The right testicle was normal. The prostate was 1 plus enlarged (on the basis of 1 to 4), smooth, movable, and of benign consistency.

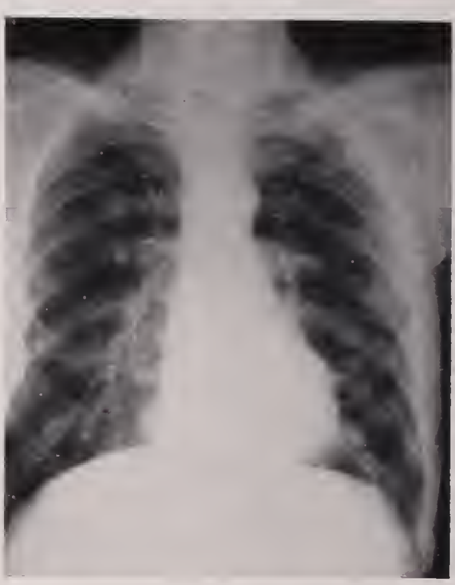


Fig. 2. Chest film demonstrating multiple metastatic tumor nodules in both lung fields.

Admission chest x-ray demonstrated multiple metastatic malignant nodules in both lung fields (Fig. 2).

Laboratory Findings.—The hemoglobin was 11.4 grams per cent: leukocytes 5,300, with neutrophils 64 per cent, lymphocytes 31 per cent, monocytes 3 per cent, and eosinophiles 2 per cent. Erythrocyte sedimentation rate was 99 mm. in one hour (Westergren). The blood urea nitrogen was 13.5 mg. per cent, and creatinine was 1.9 mg. per cent.

The urine had a pH of 5.0, specific gravity of 1.025, 2 + albumin, no sugar, an occasional WBC, and 4 + red blood cells.

Electrocardiogram was normal.

Intravenous excretory urographic series on March 5, 1955, showed a well-outlined, normally functioning right kidney, and failure of excretion of contrast media by the left kidney. No definite left renal outline was visible. Multiple calcifications were present in the region of the lower pole of the left kidney (Figs. 3 and 4).

Cystoscopy on March 7, 1955, revealed an S-shaped curve deformity in the proximal third of the pendulous urethra in the area adjacent to the bulbomembranous juncture. This was produced by the left hemiscrotum and its tumor process encroaching upon the urethra and surrounding structures. A grade 1 benign trilobar prostatic hyperplasia was present. There was no evidence of intravesical tumor, calculus, diverticulum or foreign body. The bladder was filled with bloody urine and string-like clots. The right ureteral orifice was normal and clear urine appeared from it at regular intervals. A large clot was seen to extrude from the left ureteral orifice with several smaller clots behind it, followed by gross hematuria. A No. 8 French Foley acorn catheter was impacted in the left ureteral orifice and an occlusion ureterogram was made which filled the ureter to the level of the sacroiliac synchrondrosis. The ureter in this area appeared to be filled with clots. A No. 6 French catheter passed to the left renal pelvis without encountering obstruction and fresh bright red and old dark blood was obtained. Subsequent pyelographic studies revealed a filling defect in the inferior portion of the renal pelvis and an extrinsic pressure defect completely obliterating the inferior major calyceal and a portion of the middle major calyceal systems produced by a large indefinite mass in the lower pole of the left kidney (Fig. 5). This mass appeared to encroach upon the superior portion of the iliac crest and measured approximately 18 to 20 centimeters in diameter. The renal outline in the lower pole was ill-defined, irregular and distorted. On March 9, 1955, a left orchiectomy with preliminary high ligation of the cord and repair of the inguinal hernia was done.

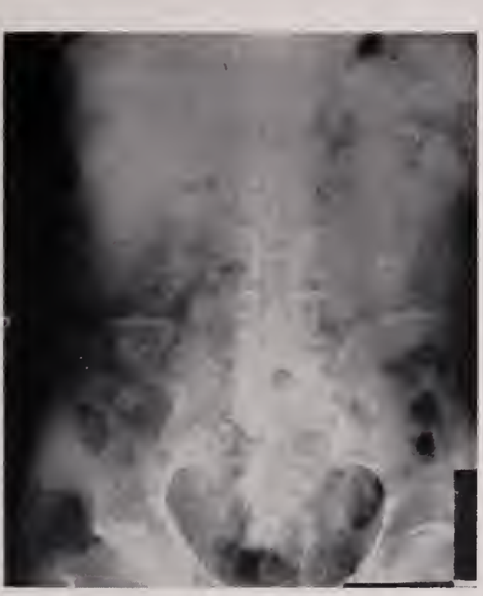


Fig. 3. KUB film prior to injection of contrast material. Normal right renal outline. Diffuse left renal outline with multiple calcifications present in region of lower pole of left kidney.

Gross Pathology Report.—Specimen consisted of an adherent mass measuring 18 x 9 x 9 cm. made up of the testis and hydrocele. The hydrocele was large, contained clear fluid, and was made up of two distinct locules. The testis itself measured 6.5 x 5.5 x 5 cm. and appeared almost completely replaced by hemorrhagic tumor with a large central area of necrosis. The tumor was adherent to the internal surface of the scrotum but did not appear to involve the scrotal skin. Microscopic sections showed no residual normal testicular parenchyma. One of the sections revealed involvement of the epididymis by tumor. All three sections showed a similar pattern, and the tumor was characteristic of

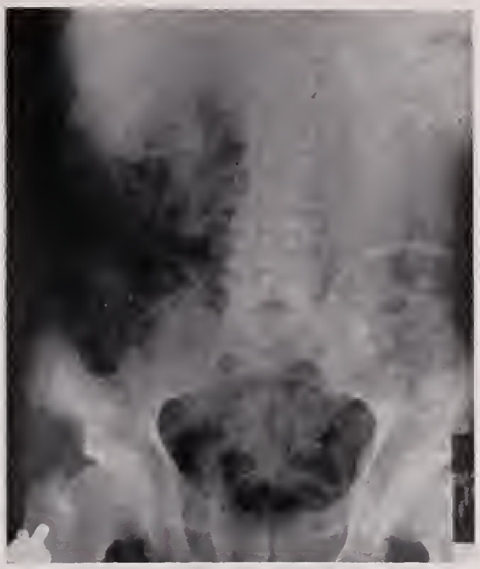


Fig 4. Excretory urographic series five minute film demonstrating normal right upper urinary tract. No demonstrable function of contrast material in left renal area.

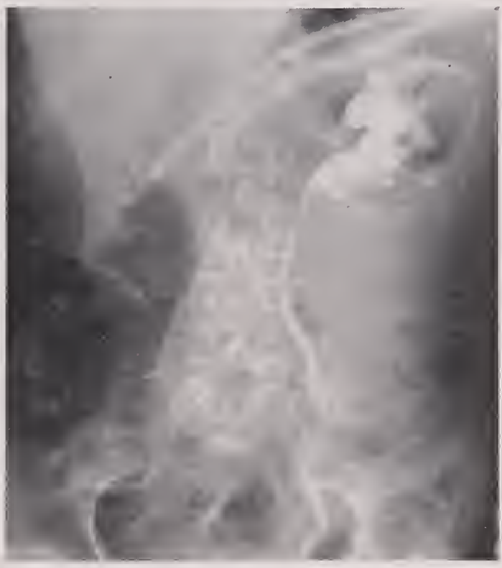


Fig. 5. Left retrograde uretero-pyelogram demonstrating tumor defect in renal pelvis and in lower pole of left kidney. Note blood clots in ureter producing filling defect at ureteropelvic juncture and also large defect in region of junction of middle and lower third of ureter. The patient had an acute gastric dilatation during the course of anesthesia and this was relieved by stomach tube seen in film.

classic hypernephroma. The epithelial cells had clear cytoplasm and in areas formed small glands and tubules. The nuclei varied only slightly in size (Figs. 6 and 7).

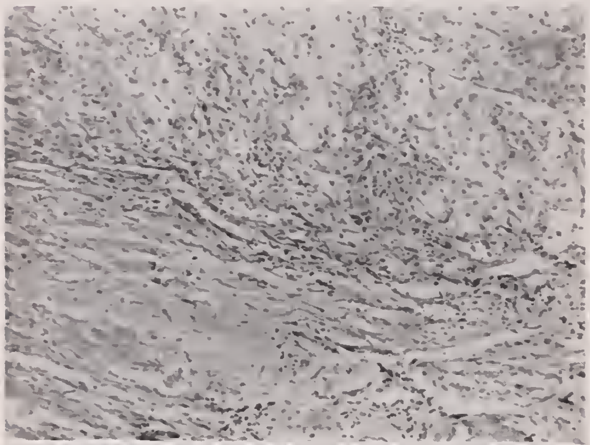


Fig. 6. *(above)* Lower power section of testicle showing metastatic hypernephroma.

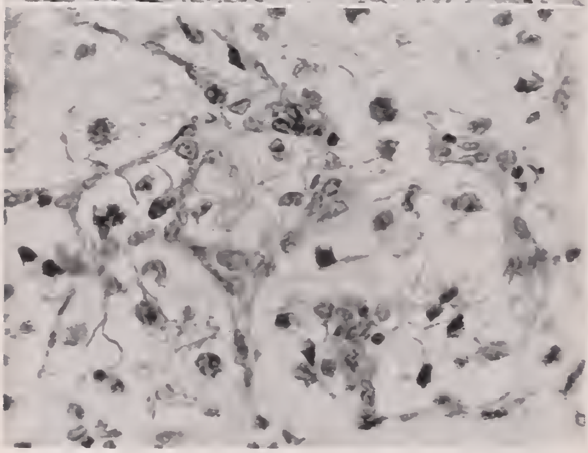


Fig. 7. *(below)* High power section of tumor area involving left testicle.

Course following surgery was satisfactory with the exception of fever, which gradually diminished by the sixth postoperative day, and a minimal separation of the wound in the area adjacent to the penis. His voiding pattern was fair, with only an occasional involuntary urination. He was discharged on the nineteenth postoperative day, but was re-admitted the following day because relatives were unable to care for him. The patient's course after readmission was progressively downhill. Temperature varied from 99 to 103.8° F throughout the remaining days. The urine became purulent, and an indwelling urethral catheter was placed. Seropurulent drainage appeared spontaneously from the upper angle of the wound. Patient refused food or fluids, became lethargic and finally expired on April 21, 1955.

Autopsy Findings.—The body was that of an elderly white man 168 cm. in length, estimated to weigh 90 pounds, well-developed but emaciated. There were no significant special marks of note with the exception of a recent surgical scar in the left inguinal region, at the upper end of which there was an open draining sinus. The peritoneal cavity was opened in the usual manner. The diaphragm arched to the sixth interspace bilaterally. The liver extended to the costal margin in the right midclavicular line and 4 cm. below the xiphoid in the midline. The pleural cavities showed bilateral fibrous adhesions but were otherwise within normal limits. The pericardial sac showed no gross abnormalities. The heart weighed 320 grams. The epicardial surfaces were smooth. The heart was opened in the usual manner. The endocardial surfaces, valve rings and leaflets were within normal limits. Section of the coronaries revealed mild diffuse sclerosis. The right lung weighed 600 grams and the left 540 grams. Diffusely distributed throughout all lobes of both lungs were subpleural and parenchymal tumor nodules, the largest measuring 3 x 2 cm. These tumor nodules appeared gray and presented irregular areas of necrosis. The intervening pulmonary parenchyma was within normal limits. The spleen weighed 600 grams and showed diffuse congestion. The congestion of the spleen may have been secondary to pressure from an enlarged tumor involving the left kidney. The liver weighed 1,810 grams and showed no gross abnormalities. The gall bladder contained no calculi. The bile ducts were patent. The esophagus, stomach, small bowel and colon showed no significant gross abnormalities. The pancreas and adrenals were grossly within normal limits. The right kidney weighed 250 grams and was grossly within normal limits. Sectioning of the right kidney revealed the presence of numerous cortical abscesses. There was moderate hydronephrosis and hydroureter on the right. The exact origin of this hydronephrosis was not evident from gross examination. No stricture or obstruction of the ureter was detected. The left kidney weighed 920 grams and was diffusely replaced by irregular nodules of partially necrotic tumor. Dissection of the renal vein on the left revealed grossly visible tumor thrombus extending into the main renal vein. Dissection of the renal pelvis revealed a large mass of tumor which extended into the renal pelvis. The ureter distal to the pelvis on the left was of normal caliber. The urinary bladder showed no gross abnormality. The left testicle had been removed. The right testicle was grossly normal. The prostate showed no gross significant abnormalities. The aorta was within normal limits. There was a nodule in the inferior portion of the right lobe of the thyroid 1 cm. in diameter. The lymphatics were within normal limits. The head was not examined.

Microscopic Findings.—Section of the left renal tumor revealed it to be a moderately pleomorphic clear-cell type cortical adenocarcinoma (hypernephroma) of the kidney (Figs. 8, 9, 10). Sections of the right kidney revealed extreme destruction of the cortex and medullary structures by suppurative inflammatory reaction. There was an intense suppurative inflammatory reaction involving the mucous membrane of the renal pelvis and ureter. Sections of the prostatic urethra and prostatic parenchyma likewise revealed evidence of necrosis and inflammatory destruction of the prostatic

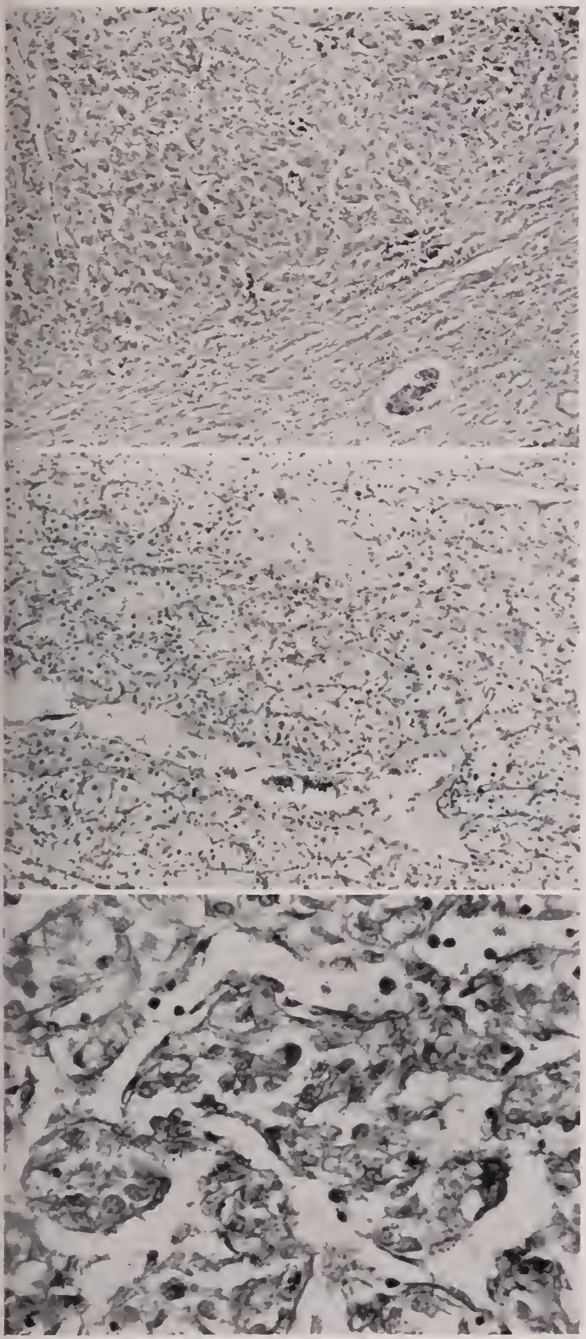


Fig. 8. *(above)* Low power section of left kidney showing tumor encroaching upon normal renal parenchyma. Note the deep staining granular type cytoplasm in this section. Fig. 9. *(center)* Lower power section of left kidney showing another section of tumor area with more commonly seen foamy type cytoplasm of tumor cells. Fig. 10 *(below)* High power section of tumor of left kidney showing tendency to more granular cytoplasm in the central tumor cells while those in the upper left hand corner have the more foamy type cytoplasm.

parenchyma. The spleen showed acute splenitis. Sections of the lungs showed terminal bronchopneumonia as well as the presence of tumor nodules histologically identical to those observed in the kidney tumor (Figs. 11 and 12). A metastatic tumor removed surgically involving the left testicle was likewise identical histologically with the tumor observed in the kidney (Figs. 6 and 7).

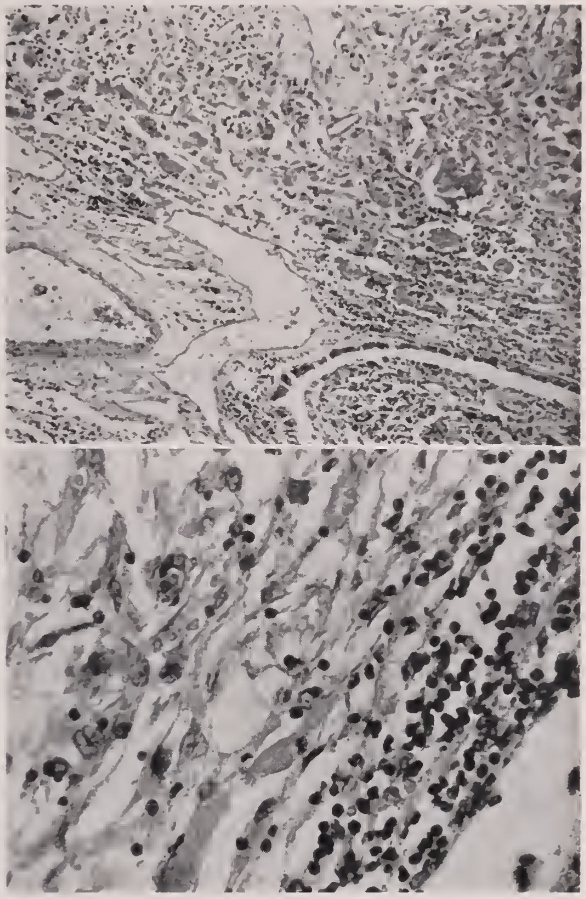


Fig. 11. *(above)* Low power section of tumor nodule of lower lobe of left lung with adjacent normal lung tissue. Fig. 12. *(below)* High power section of tumor nodule metastatic to left lung.

Comments

This case is unusual, for the testicle is rarely involved by metastatic carcinoma from the kidney. Creevy[5] reports one case of a thirty-seven-year-old male suffering from backache in the region of the sacrum and low-grade intermittent fever for several months before a swelling of the left side of the scrotum and urinary retention simultaneously developed. Catheterization was followed by the development of a tender hard mass in the penoscrotal angle which was thought to be a peri-urethral abscess, but incision found the mass to be a solid tumor and microscopic examination showed a necrotic adenocarcinoma. The patient died twenty-four hours after amputation of the penis, and necropsy disclosed a hypernephroma of the left kidney with metastases to the lungs, liver, regional glands and left epididymis.

A second case by Bandler[1] is of particular interest because the first sign of hypernephroma was a testicular tumor which was considered pathologically to be a rare primary tumor and antedated the presence of the kidney tumor by two years. Bandler's case was that of a forty-seven-year-old male executive who presented a swelling and pain in the right testicle of two weeks' duration with the loss of ten to fifteen pounds of weight. X-ray and examination of the chest at that time was negative, and an excretory urographic series was normal. Clinical impression was orchitis of an undisclosed origin. Following several days devoted to better regulation of a diabetic state, the testicle failed to improve and the right scrotal site was surgically explored. The testicle was removed and a gross diagnosis of orchitis with abscess formation was made. Microscopic study, however, showed an unusual primary testicular tumor, presumably from the interstitial cells of the testis. Periodic examinations by his physician were carried out one and two years later, disclosing no recurrence of the tumor or evidence of metastatic lesions. However, two years and three months after the initial surgery, the patient was admitted with symptoms of gross hematuria and right flank pain. Urologic work-up demonstrated a pyelogram consistent with a tumor of the right kidney and this was removed. A diagnosis of hypernephroid carcinoma of the right kidney was made. The previously removed right testis was reconsidered as probably a metastasis of the present tumor rather than a primary interstitial cell tumor as previously reported. The metastatic testicular tumor antedated the renal tumor clinically by two years, for, at the time of orchiectomy, urography failed to demonstrate the presence of the kidney neoplasm. Metastatic implants clinically can antedate the presence of the primary tumor which is obviously very slow in its growth, but, even when the renal tumor is very small in size, metastasis can occur early and single metastasis can occur despite the continued growth of the tumor. Removal of the metastatic focus together with the primary site is worth while, for this case shows a clinical surgical cure three and one-half years after removal of the metastatic focus.

Willis[10] reported four cases of metastatic tumor in the testicle from primary kidney tumors. One patient had an adenocarcinoma of the left kidney with metastatic lesions in the left spermatic cord and testis, and also in the erectile tissues of the penis. Another had carcinoma of the left kidney with secondary involvement of the epididymis and spermatic cord. A third case of a left renal carcinoma with extension to the testis along the spermatic vein was cited. The fourth patient, a child, had a nephrectomy for Wilms' tumor with subsequent appearance of a scrotal tumor, and, upon removal of the testis and cord, a similar tumor was found lying partly within the spermatic vein.

Discussion

There is no doubt that a fairly high percentage of the cases of renal neoplasms will continue to escape recognition until late in their course. Not merely because patients are prone to delay medical consultation and because the disease often produces syndromes difficult to identify, but chiefly by the fact that the first symptoms to attract the patient's attention are so often not due to the tumor itself, but to a metastasis or a local extension. This is the situation which cannot at present be fully met in any practicable manner. To be sure, a painstaking elicitation of the history would perhaps have revealed facts which would have brought up the question of renal neoplasm, particularly if an episode of hematuria which had been forgotten by the patient or a brief attack of renal colic occurred. A more careful physical examination in obscure cases might be helpful, but is of uncertain value since many normal kidneys are palpable and since many large tumors escape detection. The key to the whole problem lies in considering the possibility of a malignant renal tumor in every case of an obscure ailment, particularly so in cases of the osseous, pulmonary, gastrointestinal or nervous tract, or those of obscure fever or anemia. In these cases, investigation with excretory urography may be the most valuable diagnostic aid. Several instances of solitary metastases diagnosed microscopically as primary tumors have been followed by removal of a hypernephroma with survival of the patient.

Summary

A discussion of some of the problems encountered in diagnosis and treatment of renal neo-

(Continued on Page 741)

Rupture of Muscles and Tendons

ALAN D. WEINER, M.D.
PAUL R. LIPSCOMB, M.D.
Rochester, Minnesota

RUPTURES and tears of muscles and tendons are not so rare as the paucity of literature regarding them might indicate. Many patients with incomplete ruptures of this nature apparently are being treated conservatively with little improvement in symptoms because the pathologic changes underlying the injury escape detection. Total rupture of the belly of a muscle may be followed by the rapid development of a hematoma so that the defect between the fragments cannot be palpated; consequently, with little loss of function, the injury may pass unrecognized.

Ruptures of muscles and tendons without concomitant violence have been accepted on the basis of clinical and surgical experience as evidence of underlying pathologic changes involving the myotendon unit.[1] Experimental evidence exists to support this concept. The work of McMaster[2] on rabbits showed that a normal tendon does not rupture when subjected to severe strain. Instead, the insertion of the tendon may pull away with a fragment of bone, the belly of the muscle may rupture, the junction between tendon and muscle may separate, the origin of the muscle may pull away with a fragment of bone or the bones may fracture. These experiments also showed that a severe strain would be required to rupture the tendon when 50 per cent of a tendon's fibers were severed; even after severance of approximately 75 per cent of a tendon's fibers, normal activity did not result in rupture.

Etiology

Gilcreest[3] has summarized the factors leading to disruption of the myotendon unit. Senility is considered by many investigators to be a prime factor. Aging results in diminution of muscular resiliency and elasticity and in some instances in decreased vascularity. Whether minute or complete, tears of the shoulder cuff are recognized as being superimposed on a degenerative lesion, usually in patients beyond middle age. The tendon of the supraspinatus muscle thus affected rubs as it passes between the head of the humerus and the acromion or the coraco-acromial ligament and will rupture. In young people, muscles are ruptured more often than are tendons, whereas the converse is true in elderly people.

Arthritis may result in rupture of tendons by production of bony ridges in degenerative arthritis or because of rheumatoid tenosynovitis and attrition. In the latter instance, chronic inflammation in the tendon sheath may lead to adhesions, flattening and thinning, with such insidious progress that the patient may not realize when the actual rupture has taken place. Rheumatoid nodules actually may be present in the tendon and be the primary lesion.[4] Myositis, acute infectious diseases, syphilis, tuberculosis and tumor also may involve muscles and cause rupture. Excessive fatigue is often considered a factor that perhaps renders the muscle fibers less likely to resist a sudden forceful pull. Certain occupations that focus a source of external stimuli often are related to the site of rupture, as in kettledrummer's palsy and rider's tendon.[5]

Direct trauma may result in rupture of a tendon either immediately or as a delayed result after repeated minor trauma. This also includes such factors as so-called spontaneous rupture of the extensor or flexor tendons of the hand after traumatic or rheumatoid arthritis of the distal radioulnar joint, Colles' fracture and Kienböck's disease. These entities are not predicated on the intrinsic strength of the involved tendon. Numerous ruptures of tendons occur after indirect trauma, during which forces are transmitted along the entire myotendon unit. Such an injury frequently reflects strength and integrity of the components of the myotendon. An example of such indirect trauma would be a mallet finger or, in some instances, rupture of the components of the quadriceps mechanism.

Of great interest are the idiopathic ruptures of

From the Section of Orthopedic Surgery, Mayo Foundation and Mayo Clinic, Rochester, Minnesota.

The Mayo Foundation, Rochester, Minnesota, is a part of the Graduate School of the University of Minnesota.

TABLE I. MUSCLES AND TENDONS LISTED IN THE ORDER OF DECREASING FREQUENCY OF RUPTURE

Intrinsic extensors of fingers (mallet finger and boutonnière deformity)
Shoulder cuff (tears)
Components of quadriceps mechanism
Triceps surae and plantaris
Extensor pollicis longus and extensor digitorum communis
Extensors of toes
Biceps brachii
Pectoralis major, pectoralis minor, trapezius, sacrospinalis, rectus abdominis, deltoid, adductors of the thigh and anterior serratus

muscles or tendons, such as rupture of the heel cord, that occur in young people in the apparent absence of any underlying pathologic changes. There are extremely few reports of ruptures occurring with the myotendon unit in a relaxed state. In most instances, ruptures occur with one unit in strong contraction when a group of antagonists is suddenly brought into play. Frequently, a surprise or unexpected movement occurs.

In rupture of a contracted muscle, an audible snap, like the crack of a whip, is often heard. In spontaneous rupture, the startled patient often will look at the site of injury to see what has hit him.

Site and Frequency of Rupture

It is difficult to ascertain the order of frequency with which various tendons and muscles rupture not only because of the great variance in published series but because many investigators consider that clinical figures do not reflect the true incidence. For instance, some necropsy studies show rupture of the supraspinatus muscle in 20 to 30 per cent of persons past the age of sixty years,[6] whereas clinically the lesion is not seen or at least not recognized that frequently.

The accompanying table lists muscles and tendons in the order of frequency with which they become ruptured.

Response of Tendon to Injury

The behavior of tendons in response to injury depends on their environment. Two types of surrounding membrane may be present, namely synovial sheath or paratenon.

The synovial sheath ordinarily permits the tendon to go around a corner and to pull efficiently. It consists of a visceral layer enveloping the tendon and a parietal layer lining the fascial tunnel, through which the tendon glides. These layers are continuous via the mesotenon. Synovial sheaths are found in the hands, feet, long head of the biceps and the popliteus tendon. According to Fowler and associates,[7] all other tendons are surrounded by paratenon. The paratenon has an outer layer of fibrous connective tissue and an inner filler of loose areolar connective tissue. The tendon itself has a vascular, physiologically active periphery but an avascular inert core. Bulbous enlargements may develop in tendons in response to stress, as in snapping the fingers.

Synovial sheaths have the same physiologic characteristics as do joints and apparently can suppress fibroplasia. A tendon severed in its sheath ordinarily retracts and lies inertly in its bed. The appearance a few days after injury is much the same as it will be years later. On the other hand, barring infection or repeated severe trauma, which in itself may stimulate fibroplasia, a severed tendon surrounded by paratenon undergoes a remarkable degree of fibroplasia, with proliferating fibroblasts from the periphery apparently growing to effect repair. If the lesion is incised cleanly, with minimal disorder in the surrounding tissue, functional repair may take place, particularly if proper splinting is employed.

The surface layers of the tendon are also important, and their treatment may determine the success or failure of tenorrhaphy. Even with union, tenorrhaphy is not a success if the tendon will not glide. We also consider that mechanical irritation is important and that a suture in the periphery of a tendon enclosed in a synovial sheath is likely to result in a fibroblastic response in the active layer of the tendon. Hence, we recommend use of a pull-out suture rather than direct suture, particularly for repair of tendons that must glide in a synovial sheath. When an attempt is made to repair a tendon within a synovial sheath, subsequent swelling and edema at the site of anastomosis may constrict the tendon in its sheath, making it too tight to move in the fibro-osseus canal. This may result in circulatory embarrassment and necrosis in the periphery of the tendon. Consequently, partial excision of the tendon sheath is necessary in these cases.

General Aspects of Treatment

Ruptures of tendons generally create difficult problems. The rupture usually takes place through unhealthy degenerated tissues. These tissues become extensively shredded and lacerated in the process of rupturing, so that clean-cut viable ends suitable for primary repair, such as in an incised wound, are not present. When delayed repair is done weeks or months after the original injury, extensive scarring of the local region, as well as fixed contraction of the proximal musculature together with a large defect in continuity, makes treatment doubly difficult.

The best functional result following repair of tendons requires accurate and snug apposition of healthy tissue, without tension and with a minimum of foreign material at the healing site. Braided wire, silk sutures, fascia and tendon are common materials for maintaining apposition. Recently, the pull-out suture as described by Bunnell[8] and modified for use with larger tendons by McLaughlin[9] has had wide acceptance. In addition to direct anastomosis of tendons, other methods of treatment occasionally are indicated, including tendon grafts and transfer or transplantation of tendons. Tendons with short excursions that are surrounded by paratenon often are treated best by splinting the tendon in an optimal position. Some ruptures of tendons and muscles require no active treatment. It always should be kept in mind that a good functional result may be obtained after appropriate splinting whenever tenorrhaphy is not advisable for a tendon surrounded by paratenon. Even complete rupture of the tendo achillis treated conservatively may yield good functional results if splinted properly.

Management of Injuries to Specific Tendons

Severance of some tendons does not warrant surgical repair under any circumstances, either because these tendons have no essential function or because nature will repair the defect. The palmaris longus, the plantaris and the extensors of the toes fall into this group in which repair may be omitted. Tendons of secondary importance injured in complex wounds also should not be repaired lest a functionless mass of scar tissue result.[7] An example would be a complex laceration of the flexor surface of the wrist; after repair of the nerves, the flexor pollicis longus and the flexor digitorum profundus are the only tendons to be repaired primarily. In lacerations of the dorsum of the wrist, the primary tendons to be repaired would be the abductor pollicis longus, the extensor carpi radialis brevis, the extensor pollicis longus and, if feasible, the common extensor tendons. The basic requirements for satisfactory function are met by such selection, while the possibility of adhesion and scarring is diminished by avoiding repair of tendons of secondary importance.

Ruptures at Hand and Wrist.—Rupture at the insertion of the extensor tendons of the fingers into the base of the distal phalanges, the most frequent type of tendon rupture,[10] usually occurs after forceful passive flexion of the distal phalanx while the finger is being extended actively, as in "baseball finger" or "mallet finger." This also may occur in women as they tuck in sheets while making a bed. The tendon occasionally may pull away a small fragment of bone and periosteum from the distal phalanx. The treatment of this injury has been discussed widely. Most physicians agree that prompt splinting in hyperextension by means of either plaster or a Kirschner wire placed through the distal interphalangeal joint will result in union after four to six weeks. If four weeks have elapsed after injury, however, conservative treatment is generally unsuccessful and surgical correction is necessary, either by use of a tendon graft or by shortening the tendon, which may have healed in a lengthened state. Many techniques have been described for this surgical repair, with variable results.[8,11,12]

Buttonhole rupture of the extensor tendon of the finger over the proximal interphalangeal joint at the insertion to the second phalanx occurs frequently from trauma. The central dorsal aponeurotic slip ruptures and the two lateral slips loosen and become displaced in a volar fashion. This displacement is increased by the intrinsic muscle pull. These ruptures also may occur in patients who have rheumatoid arthritis. Such displacements require surgical repair.

Rupture of the extensor pollicis longus always is preceded by disease or injury. According to early German literature, such ruptures often occurred after synovitis in kettledrummers. It is seen more frequently now as a late sequela to Colles' fracture, occurring weeks or months after fracture. This may result from local necrosis either from rubbing over the site of the old fracture or from the tendon being caught in the callus subsequent to the original hematoma. Rheumatoid arthritis and tenosynovitis also may result in rupture of the extensor pollicis longus. Repair of this tendon is not possible by end-to-end suture because of the defect in continuity left with excision of the frayed and shredded ends of the tendon. Although repair may be accomplished by means of a tendon graft, transfer of a tendon is more satisfactory. Use of the tendon of the extensor indicis proprius is most satisfactory, since its range of excursion is similar to that of the ruptured tendon. However, the extensor carpi radialis brevis also may be used.

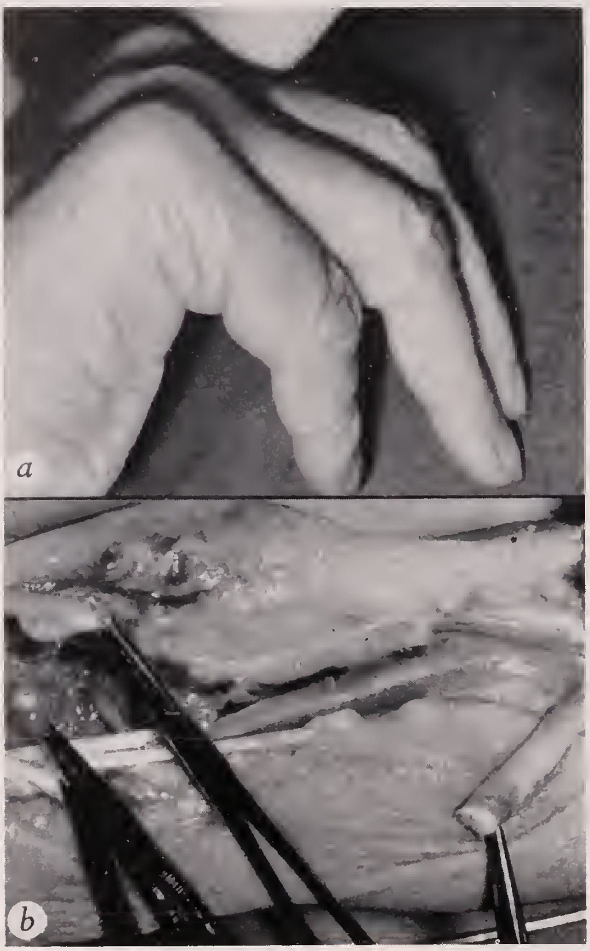


Fig. 1. Ruptured extensor tendons of the fingers in a sixty-two-year-old woman who had rheumatoid arthritis. She had ruptured the extensor tendon to the fifth finger five months previously while lifting a teaspoon. Five weeks later, she noted inability to extend her ring finger. Shortly after, she observed inability to extend the long finger.

(*a.*) This picture shows maximal extension of the three involved fingers compared to extension of the index finger shown at the extreme top. (*b.*) At operation, the proximal muscle bellies of the extensors to the long, ring and little fingers had retracted to the junction of the proximal and middle thirds of the forearm, leaving moderate defects in continuity, as pictured. Repair was accomplished by detaching the tendon of the extensor carpi radialis longus from its origin and suturing it to the distal fragments of the ruptured tendons.

Rupture of the extensor tendons of the fingers at the wrist other than from direct trauma probably occurs next most frequently in patients who have rheumatoid arthritis.[4] Extensive mobility of the distal radio-ulnar joint occurs following erosion of the dorsal carpal ligament. This is equally true in degenerative arthritis at the distal radio-ulnar joint, according to Vaughn-Jackson.[13] With continued pronation and supination, the ulna continually rubs and fragments the extensor tendons. Treatment of such injuries consists of use of a tendon graft or tendon transplant to the disrupted tendons (see Fig. 1). However, such repair often would be incomplete without resection of the distal portion of the ulna.

Lesions of Shoulder and Upper Arm.—Ruptures of the deltoid, serratus anterior, pectoralis major, coracobrachialis and triceps are rare. Tears of the rotator cuff are worthy of a treatise in themselves and will not be enlarged on.

Lesions of the biceps, well described in an excellent study by Gilcreest,[11] do merit further comment. Clinically, they may be divided among ruptures of the long head (50 per cent), short head, belly of the muscle and the tendinous insertion at the radial tuberosity. Local degenerative changes from wear and tear and also trauma are the main etiologic factors.

Acute ruptures of the biceps muscle are striking. The pain may not be extremely severe but hemorrhage usually occurs rapidly and the blood spreads down the arm beneath the deep tissues. Atrophy of the belly of the muscle, with weakness and visible deficiency, is noted later. Acute rupture of either muscle or tendon merits early repair. Rupture of the long head is usually more or less transverse, either in the joint or above the intertubercular groove. The method of repair depends on the extent of the pathologic changes in the tendon and the location of the rupture. End-to-end anastomoses are generally not practical unless the rupture occurs at or near the junction of the muscle and tendon. The short proximal fragment generally is excised and the proximal portion of the distal fragment may be secured to the bicipital groove or to the coracoid process.

Avulsion of the distal biceps tendon may be treated by suture to the anterior surface of the radius or to the brachialis near its ulnar attachment. However, if a deficit in length need not be made up, the tendon may be reattached to the biceps tuberosity by means of a pull-out wire.

Rupture of Extensors of Knee.—Five lesions may be commonly encountered, namely (1) a tear in the quadriceps proper, (2) a tear in the tendinous sheath above the patella (most likely to occur in elderly patients with senile changes in the tendon), (3) a tear of the patellar ligament, (4) a fracture through the patella, and (5) a tear at the tibial tuberosity (in younger growing patients).

Rupture of the extensors of the knee generally results from one of two mechanisms. A person starts to fall and holds himself straight with difficulty; in that instant, he feels a violent crack in his leg and he falls. The second mechanism involves a fall on a strongly flexed knee, with the resultant counterleverage producing a tear of the muscle or tendon or a fracture of the patella. It is considered that the patella is the most vulnerable structure when the myotendon unit is normal. Immediate hemorrhage follows the injury and the patella is found to be abnormally movable. Extension of the leg is impossible when the rupture is complete, although limited extension is possible with partial rupture. Treatment of a complete rupture is surgical. This may be done early if one can palpate the ends of the torn muscle but the hematoma forms so rapidly that frequently one may not recognize the true nature of the injury for several days. Multiple incomplete ruptures of the patella tendon rarely may result in a functionally deficient quadriceps mechanism without palpable defect.[15]

Ruptures of Soleus and Gastrocnemius Muscles

Ruptures of the soleus and gastrocnemius mucles do not always require surgical treatment. Gilcreest, in a personal communication to us, stated that Dr. C. H. Mayo some years ago discussed one of Gilcreest's papers on ruptured tendons and muscles. During this discussion, Dr. Mayo related his personal experience with a rupture of the soleus muscle as follows:

> I had on a pair of low shoes with low heels and was running upstairs two steps at a time. My momentum was good and I slipped and fell forward, rupturing the soleus on the inner side. I wish to say that usually when the rupture of the muscle occurs the man who gets it knows it. There was no function and I could feel right away the depression of divided muscle. Within a few moments the depression filled with blood, so that it was rounded. I got home on one leg and the next day got to thinking about it. I had been in France a short time before, and in talking with a friend had commented on the fact that the girls over there used to have big calves, but now that they were wearing short shoes and high heels the calf had disappeared. I sent down and got a big cork and put it in my shoe heel, and I was immediately able to get around. In three months after keeping to this relaxation, healing had taken place without operation.

Rupture of the Achilles Tendon.—The mechanism is a sudden strain on the tendon, as in forceful dorsiflexion of the foot. The victim may be suddenly shifting his weight by jumping backward on his toes with his knees bent so that the tendon stretches or he may slip, begin to fall and try to keep his balance by bending the knees and raising the heels. Age and obesity appear to be important factors, although ruptures may occur in young and apparently healthy persons.

The pathologic conditions that may weaken the tendo achillis include pyogenic infection, gonorrhea, tuberculosis, syphilis and gout. Ossification, which is seen so frequently about ruptures of the tendo achillis, may be a factor prior to rupture, although ossification may develop after injury and need not be an antecedent manifestation. According to Bate,[16] the point of least resistance in the tendo achillis is located 2 to 4 cm. above its insertion in the os calcis. The patient who has an incomplete rupture can walk, although he has great pain. With complete rupture, he cannot walk normally, although he does not have much discomfort. Some workers have considered that it is next to impossible to make a clinical diagnosis of incomplete rupture.[17]

The treatment of incomplete tears may be conservative, the ankle being held in plantar flexion. However, a pressure dressing that is too tight about the wound can cause adhesions of the tendon to the posterior capsule of the ankle joint, with subsequent disability. Complete ruptures are treated surgically whenever possible.

Summary and Conclusions

Ruptures of muscles and tendons are not so rare as the lack of literature concerning them might suggest.

Normal tendons do not rupture when subjected to severe strain. Rupture may occur at the bony origin or insertion of the tendon, at the musculotendinous junction, or through the belly of the muscle. Pathologic processes may undermine the integrity of the myotendon unit so that minor strain may result in so-called spontaneous rupture.

Response of a tendon to injury depends to a great extent on whether its enveloping tissue is a synovial sheath or paratenon.

Repair by direct anastomosis is often not possible in "spontaneous" rupture of tendons, and other methods of treatment, such as tendon graft, transfer of tendons and transplantation of tendons, sometimes are utilized. Rupture of certain tendons seldom, if ever, requires surgical repair.

References

1. Milgram, J. E.: Muscle Ruptures and Avulsions With Particular Reference to the Lower Extremities. Instructional Course Lectures of the Americon Academy of Orthopaedic Surgeons. Ann Arbor, Michigan: J. W. Edwards, 1953, vol. 10, pp. 233-243.
2. McMaster, P. E.: Tendon and muscle ruptures: Clinical and experimental studies on the causes and location of subcutaneous ruptures. J. Bone & Joint Surg. n.s., 15:705-722 (July) 1933.
3. Gilcreest, E. L.: Ruptures and tears of muscles and tendons of the lower extremity: Report of fifteen cases. J.A.M.A., 100:153-160 (Jan. 21) 1933.
4. Laine, V. A. I., and Vainio, K. J.: Spontaneous ruptures of tendons in rheumatoid arthritis. Acta orthop. Scandinav., 24:250-257, 1954-1955.
5. Davidson, W. T.: Rider's tendon: Rupture of the adductor tendons of the thigh. Surg., Gynec. & Obst., 26:192-195 (Feb.) 1918.
6. Campbell. W. C.: Campbell's Operative Orthopaedics, Ed. 3. St. Louis: The C. V. Mosby Company, 1956, vol. 1, 1103 pp.
7. Fowler, S. B.; Eyler, D. L.; and Carpenter, G. K.: The treatment of tendon injuries. South. M. J., 46:601-605 (June) 1953.
8. Bunnell, Sterling: Surgery of the Hand. Ed. 2. Philadelphia: J. B. Lippincott Company, 1948, 930 pp.
9. McLaughlin, H. L.: Repair of major tendon ruptures by buried removable suture. Am. J. Surg n.s., 74:758-763 (Nov.) 1947.
10. Posch, J. L.; Walker, P. J.; and Miller, H.: Treatment of ruptured tendons of the hand and wrist. Am. J. Surg., 91:669-681 (Apr.) 1956.
11. Nichols, H. M.: Repair of extensor-tendon insertions in the fingers. J. Bone & Joint Surg., 33-A: 836-841 (Oct.) 1951.
12. Mason, M. L.: Rupture of tendons of the hand: With a study of the extensor tendon insertions in the fingers. Surg., Gynec. & Obst., 50:611-624 (Mar.) 1930.
13. Vaughn-Jackson. O. J.: Rupture of extensor tendons by attrition at the inferior radio-ulnar joint. J. Bone & Joint Surg., 30-B:528-530 (Aug.) 1948.
14. Gilcreest, E. L.: The common syndrome of rupture, dislocation and elongation of the long head of the biceps brachii: An analysis of one hundred cases. Surg., Gynec. & Obst., 58:322-339 (Feb. 15) 1934.
15. Zadek, Isadore: Incomplete unrecognized rupture of the patellar tendon with secondary elongation. Bull. Hosp. Joint Dis., 15:60-66 (Apr.) 1954.
16. Bate, T. H.: Subcutaneous rupture of the tendo achilles. Arch. Surg., 62:14-22 (Jan.) 1951.
17. Platt, Harry: Observations on some tendon ruptures. Brit. M. J., 1:611-615 (Apr. 11) 1931.

PROBLEM OF SYPHILIS TODAY

(Continued from Page 722)

On examination there was an extensive nontender granulomatous process of the right side of the hard and soft palate that extended into the right tonsillar fossa. A central ulceration was present. The tongue was somewhat enlarged, smooth, purplish-silver in color and somewhat indurated. Firm, movable, nontender nodes, 2 cm. in diameter, were present in each submaxillary area.

It was our impression that the oral lesion was a gumma. The histopathologic pattern of tissue removed for biopsy was compatible with this diagnosis, with no evidence of a malignant lesion being present. The patient's serologic tests for syphilis were positive, but the cerebrospinal fluid examination was reported as negative.

The patient was given 10,600,000 units of penicillin intramuscularly in divided doses for ten days. At the end of the period, there was marked healing of the granuloma of the mouth.

Summary

1. The records of 1,559 patients with positive serologic tests for syphilis are reviewed, and the cause of the reaction is determined insofar as this is possible. These results are summarized in tabular form.

2. Short case reports on five patients are presented as illustrative of the clinical problem of syphilis seen today.

References

1. Barnouw, Erik, and Clark, E. G.: Quoted in News and Notes. Science, 121:230 (Feb. 18) 1955.
2. Beerman, Herman; Schamberg, I. L.; Nicholas, Leslie, and Greenberg. M. S.: Syphilis: Review of the recent literature. AMA Arch. Int. Med., 97:215-248 (Feb.) 1956.
3. Kimball, Anne C.; Bauer, Henry, and Barr, R. N.: Serological testing for syphilis in Minnesota: A recommendation for a more productive use of routine testing. Minnesota Med., 38:98-106 (Feb.) 1955.

Importance of the Diagnosis of Glaucoma

P. J. LEINFELDER, M.D.
Iowa City, Iowa

FREDERICK M. OWENS, JR., M.D.
Saint Paul, Minnesota

ONCE the diagnosis of glaucoma has been established the patient is committed to a lifetime of observation and treatment. There is no such thing as a cure for glaucoma, and the best that can be had at present is adequate control of the disease. Since the course of the disease is usually progressive and because the treatment may be surgical if daily use of miotic drops does not lower the elevated intraocular pressure, and because of the fears that are engendered in the minds of many patients by mention of glaucoma, it is important that accuracy be of the highest order in making the diagnosis and caring for the follow up of these patients. Unfortunately, it is not always a simple matter to determine whether or not early glaucoma is present. The beginning stages of the disease are unaccompanied by any signs or symptoms that would enable the patient to know of its presence, and often considerable damage has occurred to the retina and optic nerve before an increase in ocular pressure is recognized during the routine ocular examination. Even the recognition of an elevated pressure is not in itself positive evidence of the presence of glaucoma, for occasionally the stress of the examination or the manipulation incident to taking the intraocular pressure will cause the patient to have a transient increase in pressure. It is obligatory, therefore, to have repeated pressure tests and to look for other evidence of changes in the eye before a positive diagnosis is made.

The relationship of glaucoma to certain symptoms should be clarified. In the usual chronic type of glaucoma there are no symptoms. The visual acuity is not affected, and if there are any changes in the visual fields, the patient is unaware of it. Pain is not present, and if there is so much as slight headache it is often passed off as being due to other things. In acute glaucoma a different circumstance exists, for in this there is a rather rapid rise in intra-ocular pressure to a very high level. With the increase in pressure there is redness of the eye, and the appearance of a halo around lights. This is accompanied by blurring and loss of vision, and increasingly amount of pain in the eye and head. This pain is so severe that it completely incapacitates the patient and causes vomiting. It persists until the pressure in the eye is relieved. Acute glaucoma is an ocular emergency that calls for immediate medical or surgical care in order to lower the intra-ocular pressure to normal. It is not difficult to diagnose and it is adequately and usually permanently cared for by surgical intervention for a peripheral iridectomy controls the pressure in most instances by preventing blockage of the narrow angle of the anterior chamber by the root of the iris.

In chronic glaucoma it is necessary to utilize special examinations to ascertain the amount of damage that has occurred because of the disease. Most ophthalmologists feel that the increased pressure is the earliest manifestation of the disease, and that the pressure causes deterioration of vision. The cause for the increased pressure is not obvious, but usually it is thought of in terms of formation of aqueous and outflow of it. Of these it seems that obstruction to the outflow is the more important in the incipient stage of the disease. Since the aqueous flows from the anterior chamber through the mesh work of the chamber angle into the canal of Schlemm and then into collecting venuoles to finally empty into the veins of the conjunctiva, it is possible for a blockage to occur at any of these places with resulting increased pressure. The effect of blockage of the posterior drainage through the vortex veins cannot readily be evaluated, but must be considered in the early stages of glaucoma. The formation of aqueous in the ciliary body can play a part in governing the intraocular pressure since a high rate of formation could overtax the drain-

---

From the Department of Ophthalmology, University Hospitals, State University of Iowa, Iowa City, Iowa.

Presented at the annual meeting of the Minnesota State Medical Association, May 21-23, Rochester, Minnesota.

age and cause elevation in pressure. The outflow facility is measured by maintaining a pressure on the globe for a five-minute period of time and observing the change in pressure that occurs. In glaucoma the facility of outflow is impaired. If the outflow rate is approximately normal but the intraocular pressure is high, it is then assumed that the rate of formation of aqueous is increased. This test can be very helpful in evaluating the presence of glaucoma.

There is a slight variation in intra-ocular pressure during the twenty-four-hour-period. Usually the differences are only a matter of two or four millimeters of mercury, and the highest reading is within the normal range. In many patients with early glaucoma a definite rise in pressure can be recorded early in the morning at the waking time. This peak often reaches pathologic levels and when found is of great value in aiding diagnosis. Therefore, in many patients with suspected glaucoma readings of the intraocular pressure are made throughout the day and night in order to obtain the diurnal curve of pressure.

Under some special test circumstances the intraocular pressure will rise if early glaucoma is present. These tests are called provocative because they provoke a glaucomatous state in the susceptible eye. Dilating the pupil, drinking coffee, or even a quart of water may cause a rise of pressure of 5 to 10 mm. of mercury in a glaucomatous eye, while in the normal there may be no change. Great care is necessary in order to correctly interpret the results of these tests, for a negative one is not proof of the absence of glaucoma, and a positive one may not mean chronic glaucoma but rather a susceptibility to an attack of acute glaucoma.

The visual fields are of exceedingly great value in learning of the presence or absence of glaucoma. Usually it can be stated that evidence of glaucoma as a destructive disease does not exist until loss of vision has been demonstrated. Loss of vision is first recognized in the visual fields. It is possible that glaucoma can be present in a very early stage without there being any evidence of it, but most often when it is that early accurrate diagnosis is not possible and only the supposition of its presence can be made. In the diagnosis and follow up of this disease the value of accurate methods for evaluating the visual fields is demonstrated.

Accuracy in diagnostic technique requires the use of the tangent screen in order to pick up the early changes that occur in the nasal periphery and about the blind spot. This is accomplished best when the 1 mm. target is used at a distance of 1 meter. The use of smaller targets is not generally advocated because transient physiologic scotomata in the region of the blind spot can be misleading. The 1 mm. target at 2 meters is required to demonstrate baring of the blind spot as the early indication of glaucoma. If larger targets are used the peripheral isopter is more than twelve degrees peripheral to the blind-spot and baring of it is unlikely until late in the disease. The use of targets larger than 1 mm. at one meter is to be condemned for such stimuli are too gross to allow effective accuracy in the early diagnosis for a very considerable loss of peripheral field can occur before it is discoverable on the tangent screen with the 2/1000 mm. target.

Through the injudicious and inaccurate use of the visual fields serious errors can be made. If one is to rely on the state of the visual field in the diagnosis and care of the glaucoma patient, it is necessary that the fields be the most accurate obtainable. Furthermore, the limitations must be understood and repeated tests may be necessary over a period of time in order to establish the normalcy of the eyes. As indicated above the use of large targets prevents the demonstration of pathologic changes in the fields. Errors are also made in placing too much trust in a single visual field determination that shows concentric, nasal or temporal contraction, with or without enlargement of the blind spot. These appearances can be the result of many things other than glaucoma, the most frequent being fatigue. Apparent changes in the region of the blind spot may occur if small targets are used (1/2000 mm.), for transient angioscotomata are demonstrated with this technique. Most frequently errors occur in the interpretation of fields obtained at follow-up examinations. Under these circumstances there can be apparent changes that are transient in nature and due to general or local conditions not directly associated with the glaucomatous process. Emotional strain, fatigue, illness, exposure to bright light can cause apparent deterioration of the fields—a fact that can be readily demonstrated by repeating the test at a more favorable time. Opacities in the lens due to nuclear sclerosis and senile cataract may cause change in the visual fields that can simulate those of glaucoma. Narrowing of the visual fields will occur in many glaucomatous patients after constriction of the pupils. A standard pupil size should be maintained in taking visual fields in order to avoid false changes that would appear to indicate lack of adequate control.

Although changes in the nerve head are ultimate consequences of glaucoma, the recognition of glaucomatous cupping of the disc is not of significance in the diagnosis of early glaucoma. Therefore, the presence or absence of the disease must be established through study of the intraocular pressure and the visual fields.

Once the disease is diagnosed, it is necessary for the patient to begin a regime that will continue for the remainder of his life. This regime requires that he use the prescribed medication at regular intervals every day without fail. He must make regular visits to the oculist in order to have measurements of his ocular pressure and visual fields. He lives always in a consciousness of the progressive nature of his ocular disease, and with the knowledge that neglect of his treatment and observation will mean accelerated loss of vision. This must be explained to the patient so that he understands the nature of the disease, the necessity for treatment and the importance of repeated observation. Yet this knowledge should be given without inducing unnecessary fear. If the patient can be adequately apprised of his condition and if he can be made to carry out his treatment, there is no reason for threatening him with blindness.

There is diversity in practice concerning the patient who is suspected of glaucoma but in whom positive diagnosis cannot be made. It does not seem justified to subject these persons generally to the mental concern that results from a positive diagnosis and in many cases no treatment may be required. Observation of such patients over a long period of time demonstrates that an elevation of intraocular pressure is carried by some persons over a period of years without changes in the visual fields. Such patients diagnosed and treated as glaucoma, of course, do very well for their response is ideal—no changes in the vision or visual fields occur. These people may not have glaucoma, yet one wonders if many of them are not included when mass studies are made of the intraocular pressure of the general population. All of us see patients who are using miotics who have been diagnosed as having glaucoma but in whom the evidence of the disease is still lacking several years after the cessation of the use of a miotic. It can likewise be stated that a certain number of these patients with suspiciously elevated pressure have early glaucoma. One has to decide whether to await evidence of the disease in the visual fields or whether to err on the side of positive diagnosis in the interest of saving vision. Some practictioners advise miotics for all patients who have an increased intraocular pressure because they thereby avoid the possible deterioration that would occur in a glaucomatous patient without treatment. However, it is then also reasoned that because the pressure is not lowered by miotics, surgical intervention is necessary. It appears reasonable that visual field changes should be demonstrated before surgery is advised, except in the presence of the narrow angle type of glaucoma that is relieved by peripheral iridectomy. Where possible I prefer to observe the patients over a period of time in order to demonstrate the presence or absence of changes in the visual fields. Under careful supervision such patients can still be diagnosed long before any serious damage has occurred to the eye.

ASSURE TWO GOOD EYES

Children's vision should be checked early, preferably before the age of four, according to Dr. Henry F. Allen, Boston ophthalmologist. The "critical time" in developing acute vision is between the ages of one and seven, for the learning ability of any eye sharply falls off after that, he stated.

Children whose eyes obviously turn inward or outward usually receive treatment early. But many others, whose difficulties are in only one eye, frequently do not receive treatment until too late. There is always the chance that the child will lose the good eye through disease or injury, Dr. Allen warned.

In many cases the prescription of glasses at an early age is enough to insure normal development of both eyes instead of only one. In other cases the poor eye can be "taught" to function by covering the good eye with a patch and forcing the bad eye to work.—Allen, H. F.: *Today's Health,* 34:22 (Sept.) 1956.

Case Presentation

Chlorpromazine Therapy Complicated By Agranulocytosis and Jaundice

ROBERT P. JEUB, M.D.
Minneapolis, Minnesota

LEONARD J. MICHIENZI, M.D.
Saint Paul, Minnesota

CHLORPROMAZINE [10-(γ-dimethylamino-n-propyl)-2-chlorophenothiazine hydrochloride] was introduced into this country approximately three years ago and since that time has enjoyed extensive use in the symptomatic treatment of some disorders of the nervous system. There have been few unfavorable reports associated with its usage. However, there have been some contraindications to its use reported in regard to toxicity and even fatality.[1-4]

This case report is submitted because it illustrates more than one serious complication occurring with the use of this drug and, therefore, Chlorpromazine may be considered potentially dangerous. Due to its indiscriminate use by physicians, other than neuropsychiatrists, we feel it important to recognize more than one toxicity when it endangers life. Jaundice and agranulocytosis have been reported separately; however, neither have been reported concomitantly in the same patient without fatality. In this patient both complications disappeared without sequelae twenty-five days after cessation of Chlorpromazine therapy.

Report of Case

R. P., a forty-year-old white salesman was first examined in June, 1948, following a back injury. At this time he presented a syndrome of rootlet irritation and was treated conservatively with bed rest and analgesics. A tentative diagnosis of herniated nucleus pulposus was suggested. He made an uneventful recovery from the acute episode and continued to take analgesics containing codeine for relief of back ailments and nervous tension. In 1950, he experienced a recurrence of low back pain, and a myelogram (pantopaque) revealed a defect in the contrast media at L4-5, left, which was compatible with a herniated nucelous pulposus. The patient refused operation and was again treated conservatively. He recovered slowly and continued to take medications containing codeine for the next year. He developed chronic neurologic symptoms (atrophy in the left foreleg, absent left ankle jerk, and paresthesias of the dorsum of the left foot). Back pain was a cardinal symptom. He was advised surgery and again refused. Instead, he chose to visit many physicians and received prescriptions for enough codeine (six to eight grains daily) to keep him "free of pain and buoyed-up enough to continue work." The industrial clinic he was attending refused to give him such large quantities of the narcotic and he began to forge prescriptions to obtain drugs. He was apprehended in district court and was sent to a state hospital as an inebriate. The codeine habituation was undetected and he experienced restlessness, depression with feeling of anxiety, irritability, periods of excitement, and indigestion. Sixty days later he was discharged, asymptomatic, to his home.

Early in 1954, two years later, he began to take terpin hydrate and codeine elixir NF, 8 to 12 ounces, daily until February, 1955, at which time he had difficulty in procuring the medicine and wished to withdraw voluntarily but was fearful he might again have the same withdrawal symptoms. He was therefore hospitalized (September 10, 1955) and given Chlorpromazine, 50 mg., intramuscularly, three times a day for three days, and 50 mg., orally, three times daily (total dose, 300 mg. daily), and the codeine preparation was reduced 50 per cent each dosage. He made an uneventful recovery and was discharged (fourteen days later) September 24, 1955, on 50 mg. four times a day to control psychomotor irritability. His attitude was good, his adjustment satisfactory, and he was anxious to return to work.

September 29, five days after discharge from the hospital, the patient complained of cough, dyspnea, nausea and anorexia. He had a temperature of 103.6° F. and was slightly icteric. Laboratory studies revealed a total white blood cell count of 2,300 and blood smear showed a predominance of lymphocytes. Chlorpromazine was discontinued, penicillin was administered and thirty-six hours later the white blood cell count was 4,000 (predominance of lymphocytes). Nausea was present. There were enlarged lymph nodes in the anterior cervical chain bilaterally, and laboratory tests revealed evidence of jaundice (total serum bilirubin 12.4 mg/100 cc. of serum). Thorazine was discontinued and the jaundice remained intense until October 12, when it began to disappear. It was evident, however, by laboratory tests (serum bilirubin 7.5 mg./100 cc. of serum) until October 20 when the tests were considered to be within normal limits (serum bilirubin total 2.1 mg./

Dr. Jeub is consultant in Psychiatry and Neurology, Hastings State Hospital, Hastings, Minnesota.

100 cc. of serum). The value for hemoglobin and results of leukocyte count, differential peripheral blood smear, heterophyle antibody titre, and liver function tests were all within normal limits. His appetite returned and he began to gain weight; his attitude and manner were healthy and his adjustment and capacity for work were considered to be normal. His overt anxiety was controlled with 2-methyl-2-n-propyl-1,3-propanediol dicarbamate.

Comment

The relationship between jaundice, agranulocytosis and Chlorpromazine administration has been previously reported.[5,6] This case report more closely identifies these complications. A review of the literature failed to reveal simultaneous complications of this type. It is cogent to note that agranulocytosis may occur with or without jaundice, and that usually this complication is reversible with the withdrawl of Chlorpromazine. We believe it essential to examine the hemogram in patients exhibiting jaundice, who are taking Chlorpromazine, because of the possibility of agranulocytosis. This may necessitate (specific) antibiotic administration as well as discontinuance of Chlorpromazine administration. Hodges and LaZerte[7] report a case of a sixty-seven-year-old woman who developed jaundice after Chlorpromazine therapy which did not subside and in whom agranulocytosis developed prior to death. Since the chemical structure of Chlorpromazine is thought to have a known toxicity to the hemopoietic as well as the biliary system, it is reasonable to assume these complications related. The pathogenesis of jaundice, however, in this case may be obscured. There was no definite laboratory evidence of significant parenchymatous liver damage revealed by laboratory tests.

Summary

Complications are well known to Chlorpromazine therapy. Multiple complications are reported in an individual in whom Chlorpromazine was used to control withdrawl symptoms from drug habituation. If a physician were to assume that jaundice, due to Chlorpromazine therapy, would disappear with withdrawal of the drug, he may overlook agranulocytosis and a fatality may result without administration of antibiotics. In this instance, jaundice and agranulocytosis were both reversible with cessation of Chlorpromazine therapy.

References

1. Boleman, A. P., Jr.: Agranulocytosis associated with administration of Thorazine. J.A.M.A., 157:364 (Jan. 22) 1955.
2. Goldman, D.: Treatment of psychotic states with Chlorpromazine. J.A.M.A., 157:1274-78 (April 9) 1955.
3. Prokopozycz, V.: Agranulocytosis following use of Chlorpromazine therapy. J.A.M.A., 157:1042 (March 19) 1955.
4. Moyer, J. H., et al: Laboratory and clinical observations on Chlorpromazine; hemodynamic and toxicological studies. Am. J. M. Sc., 227:283-290 (March) 1954.
5. Broadman, R. H.: Fatal case of toxic hepatitis implicating Chlorpromazine. Medical Memoranda. 2:579 (September 4) 1954.
6. Zatuchni, J., and Miller, G.: Jaundice during Chlorpromazine therapy. New England J. Med., 251: 113-116 (Dec. 16) 1954.
7. Hodges, H. H., and LaZerte, O. D.: Jaundice and Agranulocytosis with fatality following Chlorpromazine therapy. J.A.M.A., 158:114-116 (May 14) 1955.

TESTICULAR TUMOR

(Continued from Page 730)

plasms has been presented, and a case of adenocarcinoma of the kidney with metastasis to the testicle is described.

Routes by which metastases can occur are related and attention is called to two possible explanations for some of the unusual metastases which occur.

References

1. Bandler, C. G., and Roen, P. R.: Solitary testicular metastasis simulating primary tumor and antedating clinical hypernephroma of kidney. J. Urol., 55:663, 1946.
2. Batson, O. V.: The function of the vertebral veins and their role in the spread of metastases. Ann. Surg., 112:138, 1940.
3. Bell, E. T.: Renal Diseases. Philadelphia: Lea and Febiger, 1952.
4. Braasch, W. F., and Emmett, J. L.: Clinical Urography. Philadelphia: W. B. Saunders Co., 1951.
5. Creevy, C. D.: Confusing clinical manifestations of malignant renal neoplasms. Arch. Int. Med., 55:895-916, 1935.
6. Deming, C. L.: Renal neoplasms: An enigma and a challenge. J. Urol., 69:1, 1953.
7. Harvey, N. A.: Kidney tumor. J. Urol., 57:669, 1947.
8. Hollinshead, W. H., and McFarlane, J. A.: The collateral venous drainage from the kidneys following occlusion of the renal vein in the dog. Surg., Gynec. and Obst., 97:213-219, 1953.
9. McDonald, J. R., and Priestley, J. T.: Malignant tumors of the kidney. Surg., Gynec., and Obst., 77:295, 1943.
10. Willis, R. A.: The Spread of Tumors in the Human Body. London: Butterworth, 1952.

Seminar

Reactions to Penicillin

III. Reactions During 1952

WILLIAM E. WELLMAN, M.D.
DONALD J. CORR, M.D.
Rochester, Minnesota

DESPITE the relatively low order of toxicity of procaine penicillin G in aqueous suspension given intramuscularly, we have emphasized reactions to this agent because it is the preparation most widely used at the present time. Part I of this study revealed that more than half of the reported fatal and *severe* nonfatal reactions to penicillin followed the administration of this agent. Part II showed that the incidence of *mild* reactions to this preparation in 1952 and 1953 in a specific group of patients at the Mayo Clinic was about 1 per cent.

Present Study

In an effort to determine the incidence of reactions to penicillin occurring at the clinic, the year 1952 was selected for study. To review the records of all the patients who registered in 1952 would have been an insurmountable task. Therefore, the records of 1,000 new patients in each of four months, namely February, May, August and November, were studied. A total of 410 of these patients received penicillin (Table I). This indicates that approximately 10 per cent of the new patients who registered at the clinic in 1952 received some type of penicillin.

We were also interested in determining how many of the patients who received penicillin had reactions. For this reason, all records bearing the diagnosis "drug allergy to penicillin" in 1952 were reviewed. We were able to find 859 records with this diagnosis. Of these, 733 were excluded because the diagnosis proved to be on the basis of past history alone. Examination of these 733 records revealed that six patients (0.8 per cent) experienced reactions that were interpreted to be of the immediate anaphylactic type: one of these reactions resulted in loss of consciousness. We further noted that 460 (0.8 per cent) of the total number of new patients registered in 1952 (61,438) gave histories of reactions to penicillin. The accuracy of these figures can be questioned, of course, because the history of a reaction of any type is difficult to evaluate. Excluding these 733 records, we were left with 126 patients who received penicillin at the clinic in 1952 and were recorded as having experienced reactions. We excluded fifty-seven of these from this analysis because of the concomitant administration of other drugs that could have been responsible for the reaction or because there were insufficient details regarding the reaction: it is possible that some of these reactions actually were caused by penicillin. Seven additional records were discarded because the indexing was in error.

TABLE I. SAMPLING TO INDICATE NUMBER OF PATIENTS RECEIVING PENICILLIN IN 1952

Number of Records Reviewed	Month	Number of Patients Receiving Penicillin
1,000	February	124
1,000	May	105
1,000	August	101
1,000	November	80
Total 4,000		410

This left a total of sixty-two patients who experienced reactions after the administration of penicillin at the clinic in 1952. However, only twenty-three of these sixty-two patients represented new registrations in that year. As previously noted, it was estimated that approximately 6,000 new patients received penicillin, which means that a reaction to penicillin occurred in about 0.4 per cent. In the group of fifty-seven patients in whom we could not be sure as to the cause of the reaction, thirty represented new registrations in 1952. When this figure is added to the twenty-three who had certain reactions, the percentage increases to about 0.9 per cent. Therefore, the actual incidence of reactions lies some-

---

From the Section of Medicine, Mayo Clinic and Mayo Foundation, Rochester, Minnesota.

The Mayo Foundation, Rochester, Minnesota, is a part of the Graduate School of the University of Minnesota.

TABLE II. COMPARISON OF INCIDENCE OF REACTIONS TO PENICILLIN

Agent Causing Reaction	Rate of Reaction, Per Cent
Procaine penicillin G in sesame oil (1948)	0.75
Penicillin, all types (1952)	0.4-0.9
Procaine penicillin G in aqueous suspension (1952-1953)	1.0

TABLE III. DATA ON FIFTY-FIVE PATIENTS WHO HAD REACTIONS TO AQUEOUS PROCAINE PENICILLIN G IN 1952

Category	Patients	Per Cent
Male	29	53
Female	26	47
Asthma	3	5
History of previous reactions to penicillin	6	11
Age, years		
0- 9	1	2
10-19	1	2
20-29	8	14
30-39	11	20
40-49	8	14
50-59	7	13
60-69	10	18
70+	9	17

where between 0.4 and 0.9 per cent. When these figures are corrected by the method applied in Part II of this study for limitations in the period during which these patients were followed, the incidence actually might be nearer a range of 0.5 to 1.2 per cent. Table II shows that these figures compare favorably with those observed in 1948, 1952 and 1953.

Analysis of the sixty-two patients in whom reactions to penicillin developed reveals that fifty-five received intramuscular injections of procaine penicillin G in aqueous suspension. Since we were primarily interested in a study of this drug, we have recorded information concerning these patients in detail. These reactions occurred in all age groups and were equally divided between male and female patients (Table III). Only 11 per cent of these patients gave histories of previous reactions to penicillin and only 5 per cent were known to have had asthma. This would indicate that in this group of patients neither the history of asthma nor a previous reaction to penicillin is of great importance in the development of this type of reaction. Table IV indicates that the number of injections of penicillin received by a patient has little or no influence on the occurrence of a reaction. As might have been predicted, Table V indicates that most of these reactions were of the mild cutaneous type. There were no anaphylactic reactions in this group. The reactions usually developed within a week after the last injection and most of them had disappeared by the end of a week.

TABLE IV. NUMBER OF INJECTIONS OF AQUEOUS PROCAINE PENICILLIN G RECEIVED BY EACH PATIENT

Injections Per Patient	Patients	Per Cent
1	12	22
2	7	13
3	10	18
4	6	11
5	4	7
6	4	7
7	5	9
8	2	4
9	1	2
10+	4	7

TABLE V. REACTIONS TO AQUEOUS PROCAINE PENICILLIN G IN 1952

Feature	Patients	Per Cent
Type of reaction		
Febrile	1	2
Joint	3	5
Cutaneous	51	93
Day of onset after last injection (when known)		
Less than 8 days	40	75
8-14 days	10	19
More than 14 days	3	6
Duration of reaction (when known)		
Less than 8 days	24	66
8-14 days	6	17
More than 14 days	6	17

Summary

Ten per cent of the new patients who registered at the Mayo Clinic in 1952 received some form of penicillin. Unquestionable reactions to penicillin occurred in 0.4 per cent of these patients. At the same time, an additional 0.5 per cent of these patients had reactions that could have been produced by penicillin but that may have been caused by another drug. Therefore, the true incidence of reactions is between 0.4 and 0.9 per cent. Analysis of the records of fifty-five patients who received intramuscular injections of procaine penicillin G revealed that most of the reactions were of the mild cutaneous type. It was impossible to determine any factor of pronounced significance in the characteristics of these patients that influenced the occurrence of reactions to penicillin.

Current Concepts

Functional Manifestations in Organic Cardiovascular Disease

GEOFFREY BOURNE
London, England

In many patients an exact separation between functional and organic cardiac symptoms and signs is difficult. The admixture or association of the two occurs in various ways. Perhaps the commonest is that caused by an unnecessarily serious and pontifical medical opinion in the case of a patient who has a perfectly well compensated slight and nonprogressive organic cardiac lesion. Aortic regurgitation of such a slight degree as to cause no left ventricular hypertrophy or dilation or fall in the diastolic blood pressure, a leak in the mitral valve similarly without cardiac enlargement, or indeed a slight degree of stenosis of it, may give murmurs which are the only proof that the heart is in any way abnormal. Moreover such minor abnormalities may remain unchanged for many years. The untutored clinical judgment may be sufficiently uncertain as to whether to dismiss such a murmur as being of no clinical importance to the patient. or whether to play for safety and give a guarded opinion. This clinical uncertainty raises even larger uncertainties in the patient, who senses the opinion of his physician.

Similar misapprehension regarding the importance of a definite organic cardiac manifestation may arise from the patient's own brain or central nervous system. rather than from that of the doctor. A small well-healed and well-compensated myocardial infarct may arouse fears in the patient's mind which lead to the development during convalescence of the typical functional syndrome with heart consciousness, palpitation. a dull left chest ache, and an associated state of anxiety. It is most important in such circumstances for the doctor to be sure, and to transfer his certainty to the patient. that such a functional state has no pathologic or clinical relationship to the preceding myocardial attack. If it can be stated truly and firmly that the patient's own nervous system is the cause of the new pain, the symptoms and the anxiety are likely to subside.

Furthermore, the thump of premature beats, themselves of no significance. may as it were knock at the door of the patient's chest, remind him of his heart, and institute similarly a functional syndrome. Paroxysmal tachycardia with no other evidence of disease may have the same result.

Mitral stenosis, perhaps, rather more commonly than other forms of organic disease, is apt to cause a clinical picture in which functional symptoms are intermixed with those due to the organic lesion. The slapping impulse so characteristic of this condition not infrequently rises into consciousness. induces the nervous symptom of palpitation, and precipitates functional left chest pain.

The nervous factor is extremely important in hypertension. This occurs in two ways. An excitable visceral nervous system in quite a young adult may easily provoke a nervous cardiovascular reaction during examination. The heart rate will be raised from 90 to 120 or more, the heart action will be vigorous and excitable. and the blood pressure reading may be as high as 170/100. In such cases there is no other abnormality to be found radiologically, in the cardiogram or in the retinal vessels. Furthermore, when the blood pressure is taken with the patient no longer excited normal figures are found. This condition of nervous hypertension is usually quite latent, so far as the patient is concerned, and is only revealed by a routine medical examination for insurance purposes or for military service. If the examining physician is wisely silent about the situation, no further troubles follow. If the state of affairs is mistakenly labeled hypertension the consequences to the patient's future morale may be serious.

(Continued on Page 753)

Dr. Bourne is Physician-in-Charge, Cardiological Department, St. Bartholomew's Hospital, London, England.

This is the last in a series of four articles by the author on this subject.

Continuation Studies

The Genesis of Intestinal Atresia

C. N. BARNARD, M.D.
Minneapolis, Minnesota

J. H. LOUW, Ch.M.
Cape Town, South Africa

The first case of congenital occlusion of the intestine was probably recorded by Osiander in 1797. A few years later Meckel published the first paper on the probable genesis of this anomaly, and since then various views on the causation of intestinal atresia have been expressed. Most of these were based on isolated morbid anatomical findings or indirect experimental evidence and can be briefly summarized under three main headings:

1. *Developmental Defects:* Under this heading we group the theories of Meckel, Bland-Sutton, and Tandler, who explained the anomaly as a failure of the correct development of the foetal gut.

2. *Foetal Accidents:* Here intra-abdominal catastrophes, such as intussusceptions, volvuli, kinks, et cetera, were blamed for the atresia.

3. *Foetal Disease:* Foetal peritonitis or ulceration were incriminated by some investigators.

When all these theories are studied in more detail it becomes certain that one view cannot explain all cases of congenital intestinal atresia.

In 1952 Louw reviewed seventy-nine consecutive cases of atresia and severe stenosis in newborn infants at the Hospital for Sick Children, Great Ormond Street, London, and noted that certain features of the anomaly suggested that some atresias may be due to interference with the blood supply to a portion of foetal gut. These features include the following: (1) Anomalous vascular supply to the atretic portion, e.g., a V-shaped defect in the mesentery. (2) Early necrosis of the proximal blind end before the tension in this area has risen to any extent. This occurred in 20 per cent of the cases, and in half of these cases the infant was less than forty-eight hours old. (3) Postoperative atony and ileus in apparently healthy blind ends anastomosed to the distal bowel.

Similar observations have been reported by other workers and four cases seen during 1953 and 1954 at Groote Schur Hospital, Cape Town, further strengthened our belief in the vascular hypothesis. In one case an infant was born with aplasia of the descending and pelvic colons; at autopsy there was complete absence of the inferior mesenteric artery. The second case was of an infant operated on for ileal atresia, whose resected specimen clearly showed the remnant of an intussusception in the distal segment. In the third case—a newborn infant with intestinal obstruction—the ileum clearly showed the presence of a volvulus which was presumably responsible for the atresia. The fourth patient was an infant with intestinal atresia, in whom it was found at operation that a congenital band had caused infarction of the bowel and was probably responsible for the atresia.

Although strangulation causes infarction of the bowel followed by gangrene perforation and peritonitis in postnatal life, the train of events is different in the sterile foetal bowel. Here strangulation results in the absorption of the infarcted segment with, at the most, a complicating meconium peritonitis.

The question may be asked, "But how do we know that the vascular interference precedes the atresia and not atresia the vascular occlusion?" Thus more substantial experimental proof was sought in the following manner:

Operations were done upon dogs *in utero*, ligating the mesenteric vessels which supply a short segment of the small bowel. The mother dog was then allowed to go to term. In puppies so operated upon and sacrificed soon after birth, the bowel proximal to the infarcted segment was found to be distended, ending in a bulbous tip. The bowel

(Continued on Page 753)

Dr. Barnard is in the Department of Surgery, University of Minnesota Hospitals.

Dr. Louw is Professor of Surgery, University of Cape Town, South Africa.

Cancer Detection

Minnesota Doctors are Beginning to Detect Occult Cancer

The Cancer Committee
Minnesota State Medical Association

The results of 196 cancer detection examinations have been received in the Cancer Committee office from 182 practicing physicians in Minnesota. This brief report covers the period from January 1, 1954, to September 30, 1956. The number of patients is small; the results are impressive.

Seventy-three men and 123 women have been examined, and four occult cancers have been detected; two adenocarcinomas of the rectum, one malignant rectal polyp, and one carcinoma *in situ* of the cervix.

Gastric analyses were performed on seventy-seven people, and in sixty-two the results indicated the need for gastrointestinal x-ray examination, (forty-nine hypochlorhydric and thirteen achlorhydric). Fifty-five patients did not receive a gastric analysis. The value of this procedure in screening for those persons requiring yearly gastric x-rays is well established. This should be an integral part of the detection examination.

Precancerous conditions have been noted in thirty-nine people, or 20 per cent of the group reported so far. In the Cancer Detection Research Center, 28 per cent of people have similar precancerous lesions. The examining physicians found thirty rectal and colon polyps, one thyroid nodule, six senile keratoses, one oral cavity leukoplakia, and one suspicious pigmented nevus. In addition, suspicious findings were noted in ten examinees, and these patients are receiving treatment or are under observation by their own physician or a consultant. Included in this group were the following: questionable breast mass 1, adenopathy, generalized 1, questionable lung lesion 1 (surgery advised), suspicious neck nodules 2, and unexplained rectal bleeding 1.

The medical societies of fifty-seven of our eighty-seven counties have expressed their willingness to carry on this program of thorough screening of well persons for occult cancer. Approximately 7 per cent of our physicians are taking part so far. We hope all physicians will actively participate in this state-wide effort such that the annual cancer screening examination will become as well rooted in our practice as routine chest x-rays and immuniaztion procedures.

The benefits to be derived from this co-operative state-wide effort are incalculable. We invite the practicing physicians of Minnesota to join in a cancer crusade, and to make their examination results available for statistical study by forwarding the history and examination results to the Cancer Committee, care of the State Board of Health, University of Minnesota.

There are now more than 20,000 voluntary public health agencies in the United States.

* * *

Small lesions, suspected of being cancerous, should be excised with wide borders of apparently normal tissue, rather than invade the tissue with a small biopsy.

* * *

The prognosis of properly treated cancer of the skin is excellent.

* * *

When one-third or less of the retina is involved in retinoblastoma, there is reasonable hope that it may be destroyed by radiation therapy.

* * *

Public health operation of cancer prevention-detection clinics can serve only a small fraction of the population because annual re-examination of patients lowers the number of new admissions to the service.

* * *

Effective cancer control depends on a continuous program of public education, the object of which is to substitute optimism and intelligence for ignorance and fear.

* * *

Hodgkin first described the disease bearing his name in 1832.

* * *

The first illustration of the microscopic appearance of the blood in leukemia was shown in 1852.

* * *

The first photograph of a patient with leukemia was published in 1862.

Editorials

John F. Briggs, M.D.
Arthur H. Wells, M.D.
Henry G. Moehring, M.D.

INSULIN REACTIONS

Some diabetic patients do not like to use insulin because they fear insulin reactions. While it is true that combative behavior, unconsciousness, convulsions, and even erroneous arrest for drunkenness may result from hypoglycemia, it is likewise true that most of these unfortunate occurrences, as well as mild reactions, can be prevented by proper education of the diabetic patient. Indeed, each patient, early in the treatment of his diabetes with insulin, should be told how to recognize and treat insulin reactions.

Most patients, while undergoing an insulin reaction, notice a relatively abrupt onset of hunger, sweating and tremor. As the reaction progresses, they may have slurred speech, diplopia and confusion, followed by unconsciousness and convulsions. It is less commonly recognized that with the prolonged action of the insulins used today, some patients may have mild but extended reactions manifested by fatigue, headache, irritability, or impairment of their ability to think and communicate.

Every diabetic who takes insulin should have available at all times a supply of sugar or food containing sugar to use as soon as he feels the onset of a reaction. Failure to do so may permit an otherwise harmless reaction to progress to the point at which the patient loses his ability to take steps to correct the hypoglycemia.

Reactions are the result of too much insulin relative to the needs of the patient and may come from an overdose of insulin, failure to follow a diet, omission of part of the diet, or, more commonly, failure to eat meals on schedule or exercising more than usual. Hence, to minimize the risk of insulin reactions, the patient should measure his insulin carefully, keep his daily food intake constant, eat his meals on schedule, and avoid prolonged exertion that has not been planned for by reducing the dose of insulin that day or eating extra food.

Other members of the family should be told about the symptoms and treatment of insulin reactions. This is especially important in the case of children, the occasional patient who has trouble recognizing insulin reactions, and elderly persons who have mental impairment. With special reference to children, it is important that their teachers, their playmates, and the parents of their playmates be alerted to the problem of insulin reactions. Finally, each person who takes insulin should carry on his person a card stating that he takes insulin and should be given sugar in case he is found unconscious or behaving strangely.

Raymond V. Randall, M.D.

THE MEDICAL STUDENT COMMITTEE

The Minnesota Medical Student Committee is an organization of medical students at the University. It is a well-established student organization, respected by both faculty and students. However, it is fairly young, being officially recognized by the University since December, 1951. During these few years it has become accepted as a liaison between students and faculty and as an active body working in the interest of both groups.

The members of the committee are the elected officers of each of the four classes in the medical school; thus, it is a representative organization. It functions largely as a student council; in fact, it has come to be called the Medical Student Council. The original name of the Council was Medical Student's Advisory Committee, which was later changed to The Medical Student Committee. The dean and the assistant deans are ex-officio members. Except for an occasional visit from some other member of the faculty, this organization works largely through the dean's office.

The purpose of this organization is to advance the interests and well being of all medical students and the University. It meets monthly during the school year to carry out this objective.

During the past four years some remarkable changes have taken place in the medical school. The Medical Student Council has certainly been a factor in some of these changes. An orientation program for the freshmen has been instituted. An introduction to the clinical years has been adapted for the juniors. A new grading system is coming into being. Library privileges have been broadened for the medical student. Medical students have met with and appeared before the Administrative Committee of the Medical School. Many other changes have taken place, too many to mention here.

Anyone reviewing the work of this Committee is struck by how frequently the same items keep coming up from year to year. This is true in spite of the fact that each council has new members and new officers. Certainly, many of the problems which come before the Committee must have been present ten, twenty, thirty or more years ago. In the hope that the current problems of the medical student will be of interest to you, a discussion of some of the current business of the Medical Student Committee will be presented here at a later date.

Ralph B. Swanson
University of Minnesota

THE MINNESOTA HUMAN GENETICS LEAGUE

On July 6, 1856, Charles Fremont Dight was born in Mercer, Pennsylvania. His parents could not have guessed that their sixth and last child would leave an imprint of such great signficance upon Minnesota and the world. It is hoped that this series of six sketches will demonstrate the subtle, but fundamental, contribution made by Dr. Dight to society and to medicine and that it will be commemorative of the centennial of the birth of this unique individual.

Dr. Dight was directly responsible for the founding of the Minnesota Human Genetics League. Therefore, an account of his life is essential to an introduction to the League.

Due to the accident of birth, Dr. Dight partook of the culture of the middle of the nineteenth century, and had the crusading zeal and fire of the intellectuals of that time. The questions of those days included the abolition of slavery, Utopian community experiments, the formation of new political parties, temperance, and many social and economic reforms. Over the door of his famous "bird house" residence, which was built around a tree near Minnehaha Falls, hung the motto, "Truth shall Triumph; Justice shall be Law," a quotation from a sermon on the slavery question delivered in July, 1854, by Theodore Parker in Boston. This nineteenth century devotion to progress was thrown into the attack on twentieth century problems. One of these later crusades was to become the all absorbing one for Dr. Dight. This was the eugenics movement.

Mendel's laws of heredity were discovered by the scientific world in 1900. Dr. Dight realized that the laws might be used for the improvement of mankind with methods similar to the techniques used by the livestock breeders. He predicted the almost immediate triumphs of plant and animal breeders, which resulted in our huge agricultural surpluses of today. He recognized man's resistance to self improvement, in his statement that, "It may be foolish to try to change things from what they are to something that might be better, but it affords a little pleasure to do the trying." He always had a petition in his pocket.

Dr. Dight received his medical degree from the University of Michigan in 1879. He then served as health officer of Holton, Michigan. Following this there was a long period of foreign travel in the Near East and Europe. Upon his return to the United States he became acquainted with Minnesota as the resident physician of Shattuck School in Faribault. After more travel, he returned to take up permanent residence in Minneapolis. In 1899, he joined the faculty of the Hamline University Medical College and remained on it until Hamline's medical department was amalgamated with the University of Minnesota Medical School. He remained on the staff of the latter institution for six years. Dr. Dight was the first medical director for the Minister's Life and Casualty Union.

Despite the fact that Dr. Dight's salary probably never exceeded $1500 until he was over seventy years old, his frugal living and wise investments created an estate of some $200,000 which he left to the University of Minnesota. The bequest was to be held in trust, the income to support a center for eugenics. He never paid any income taxes. How times have changed!

Charles F. Dight, M.D., was a man of great stature. He was brilliant, unusually well informed, widely traveled, and got large returns on his investments of every kind. We will see what these intellectual investments produced later on. At the moment it will suffice to emphasize the breadth of his understanding of the problems of mankind and his compulsion to do something about many of them. This dedication of spirit in itself demands that the centennial of his birth be recognized in an appropriate fashion.

Sheldon C. Reed
Dight Institute for Human Genetics

First in a series of articles on Dr. Dight's contributions to medicine and society.

THE NEED FOR HOSPITALS AND RELATED FACILITIES IN MINNESOTA

Although $127 million has been or is being spent in the State to build hospitals and related care facilities from 1948 through 1956, Minnesota has met only 82 per cent of its calculated needs for general hospital beds. Based on the standard of four and one half beds per thousand population for the state as a whole, Minnesota needs at least 2,546 more beds in general hospitals.

The latest survey made by the Minnesota Department of Health reveals that there are 192 general hospitals in Minnesota with a total normal bed capacity of 13,907. This figure includes the beds in use in Rochester hospitals which serve large numbers of patients from outside the state. It also includes 1,264 beds in hospitals which are non fire-resistive and should be replaced.

Communities throughout the state are rapidly recognizing their responsibilities for providing modern hospital facilities and are making provision for replacing the older non-fire-resistive structures and for expanding and modernizing existing hospitals which lack the needed areas and services. Some of the major changes being made include: improvements in surgical and obstetric suites with separate scrub-up and clean-up areas; the provision of a separate nursery work room and sufficient space in the nursery to allow for the proper spacing of bassinets and permit individual care techniques; the provision of an adequate central supply, laboratory and x-ray facilities, nurses' stations, utility rooms and storage areas, as well as improvements in food and formula preparation and dishwashing areas. The replacement of bed areas which may be lost in remodeling, as well as needed additions to some of the hospitals which are now overcrowded, are resulting in rather sizable building programs in some communities. In some cases it has been decided by the community that the existing hospital, because of its age and inadequacies, does not justify a large expenditure of funds and a new hospital has been built.

It is estimated that there is now a total of $108 million in proposed hospital construction in various stages of planning. When a community builds a modern hospital, the old hospital is frequently remodeled, protected with an automatic sprinkler system and used as a nursing home, boarding care home or home for the aged. This will meet, temporarily, a small part of the very critical need for facilities for the care of our older people.

The Hill-Burton program and the recent grant of almost $5½ million to Minnesota hospitals by the Ford Foundation are providing a very real stimulus in the hospital construction field. Since Hill-Burton funds are so limited, it is impossible to meet more than a very small number of requests each year. Actually, only 16.8 per cent of the total construction completed since 1948 has received Hill-Burton assistance. Minnesota's share of the $102.8 million appropriation under the Hill-Burton program for fiscal year 1957 was $2,175,798. If the total amount as authorized in the Act were appropriated ($150 million), Minnesota's proportionate share would become somewhat more meaningful in the total picture of needs. The Hill-Burton program has now been extended through the fiscal year 1959. This program is administered by the Minnesota State Board of Health, with the assistance and advice of the State Advisory Council on Hospital Construction. It has frequently been stated by hospital authorities that the Hill-Burton program has been one of the best subsidy programs to come out of Washington. With Minnesota's needs, its population growth and the increasing number of older people, the program could very well be expanded to its maximum capacity and continued for many more years.

Helen L. Knudsen, M.D.

REHABILITATION IN PULMONARY TUBERCULOSIS

Renewed Interest in Great Britain

The first sign of renewed interest in rehabilitation of the tuberculous in England came during World War II. The scheme was named after the official number of the Government Regulation, "266/T." Although it may be said its origin lay in the necessity for manpower in wartime, nevertheless, we must admit that it was the first real advance beyond mere medical aftercare: the patient could get help, though more in kind than in money, to enable him to return to work.

The hopes that this would lead to further, much-needed advances in social medicine were realized in the passing of The Disabled Persons Employment Act in 1944. The government took powers to set up a public corporation to run Remploy factories. By 1951, ninety factories, all nonresidential, were set up in areas with most need as judged by the Register of Disabled Persons, and seven were

---

This is the sixth in a series of editorials on pulmonary tuberculosis.

allocated for the tuberculous. Up to March, 1955, 944 tuberculous persons had been admitted, of whom 428 had been placed in open industry. The others, apart from those who have been found unfit for any work or have died, have continued employment at hours agreed by the physicians in charge, their pay envelopes being made up to a living wage as necessary from other statutory sources, such as public assistance.

The government also set up fifteen Industrial Rehabilitation Units; all but one are nonresidential. These are for the "toning-up" of all disabilities. The patient with negative sputum and likely to be able to work a full day within some twelve weeks of entry can be accepted. In addition, sixteen training centers were established: there the sputum-negative patient fit for an eight-hour day can have training to work considered more suited to his physical state and functional ability. The average stay is twelve months.

It will be seen that these two latter, the rehabilitation units and training centers, do not cater for two types of patients, the first with such loss of functional ability that he cannot reach an eight-hour day within some months or years: the second with a continued or recurring positive sputum. Moreover, all three government services share the disadvantages associated with travel to and from the patient's home. Here then was the opportunity for the Voluntary Rehabilitation Center, and fortunately Section 15 of the Act had said that government help would be given to such a center provided it could supply the necessary industrial training facilities. Negotiations between the Papworth Committee of Management, the Ministry of Labor, and the Ministry of Health led to what was called "The Ministry of Labor Training Scheme for the Tuberculous."

From the time when he enters industrial training at three hours per day, the patient-worker draws allowances for himself and for his dependents. These allowances can continue for two years, or longer if the medical authorities of Papworth consider this necessary. For such time as the patient is not at work he follows the regime of treatment laid down by his medical officer.

The need for such a scheme for those willing to accept it is shown by the following facts. In 1954, 30,000 tuberculous people were drawing special rates, while between 1950 and 1954 the number of the tuberculous on the register of disabled persons had risen by 8,000, although (and this is a most significant fact for those who think tuberculosis is conquered), the total for all disabilities lumped together had fallen by more than 6,000.

R. R. Trail, M.D.

AMERICAN ACADEMY OF OCCUPATIONAL MEDICINE

In February, 1956, the American Academy of Occupational Medicine celebrated its tenth anniversary. On that occasion it was quite natural that the Academy should take stock of itself and examine its position in the world of occupational health. Without feeling complacent or smug, the Academy may justifiably take pride in its achievements.

The American Academy of Occupational Medicine differs from other organizations in its field by limiting its membership to physicians who devote full time to some phase of industrial medicine; but merely being "full time" does not of itself qualify a candidate for acceptance into the Academy ranks. A standard of quality in training and performance acceptable to the board of directors is also required. Qualifications for fellowship in the Academy are as exacting as those of the recently established specialty board in occupational medicine.

It is often stated that American medicine is over-organized. If this is true, how does one justify the formation of another organization? One answer is that any effort directed toward raising standards of practice is justifiable, provided, however, that the effort can be shown to bear fruit. An examination of the American Academy of Occupational Medicine in its tenth year amply vindicates the wisdom and vision of its founding fathers.

The Academy has held eight annual meetings, each with two or three days devoted to scientific sessions. Attendance has never been less than one half of the active members—a remarkable record even for an organization whose membership now numbers about 250. The meetings are characterized by a freedom of discussion rarely encountered in other medical gatherings. The proceedings of these meetings are published and distributed by the Academy.

The Academy has assisted other groups in organizing industrial health symposia and recently was requested by the American Board of Preventive Medicine to help in developing the examination program for candidates for certification as specialists in Occupational Medicine. Other activities of the Academy include the planning of short, intensive courses in occupational health and steps to collaborate with the American Medical Association and the I.M.A. in setting up and maintaining standards for in-plant medical programs. Thus in many ways, the American Academy of Occupational Medicine is contributing significantly toward a "new look" in industrial medicine and toward giving proper status and stature to the qualified industrial physician.

L.J.G.

TELEPHONE SERVICE

Northwestern Bell Telephone Company's expenditure for construction in Minnesota amounted to almost $26,000,000 in 1955, a record for any one year in the history of the company's operations in the state. This year, the firm's construction program will amount to even more—about $33,000,000. During the past ten years, Northwestern Bell has spent a total of more than $190,000,000 in an effort to provide the buildings, central office equipment, poles and wire required to give the people in its exchanges the telephone service they want and need. Northwestern Bell provides telephone service in more than 135 Minnesota communities, and operating these exchanges makes it one of the state's busiest industries.

The company's business has grown fastest in the more recent years, a good indication of which is the gain in the number of telephones. So far in 1956, Northwestern Bell has added 31,600 phones, bringing the total number of telephones it operates in Minnesota to 870,390. After the first phones were installed in the state more than seventy-five years ago, it took some sixty years to reach the 420,000 mark—half of today's figure—but only the last fifteen years to double that number.

Last year, the company's 837,200 phones handled an average of 4,500,000 local calls and 93,150 long distance calls per day. This is an increase of 60 per cent in the volume of local calls and a gain of 95 per cent in the number of long distance calls over the corresponding figures for 1945, which were 2,840,000 and 47,750, respectively.

Besides expanding facilities to meet new demand for service, Northwestern Bell is also busy with a continuing program of telephone service improvement to provide its customers with modern dial equipment. Last year, telephone service was changed from manual to dial in nine Minnesota communities. Eighty-eight per cent of all the Bell telephones in Minnesota are now dial, and eventually, all of the company's exchanges will have dial service.

Despite this program of mechanization, the number of Northwestern Bell employes in Minnesota has increased almost 50 per cent in the past ten years—from 6,100 in 1945 to 9,100 at the close of 1955. The telephone company's Minnesota payroll last year amounted to $36,700,000.

One of the most important activities keeping Northwestern Bell people occupied is that of making preparations for future improvements in service. One of these, which will be introduced in this state next year, is called direct distance dialing. This is an arrangement which will permit telephone users to dial many of their own long distance calls themselves without going through an operator. Already, operators in twenty-two Minnesota exchanges are able to dial numbers in distant cities straight through to their destination. This is the step just ahead of direct distance dialing by telephone users themselves.

Northwestern Bell Telephone Company

INSIDE LOOKING OUT

Television is not all controversy and debate, commercials and color, chaos and conjecture. To a vast majority of the 37-million TV families in the United States, it's a friendly adjunct to their home life; not an ogre in the front room. If they like a program, they watch it. If they don't like a program, they watch another—or turn the thing off.

To the folks who make their living in television, it's a fascinating, demanding, exciting life—and it's a lot of fun. When it stops being fun, many of them get out of it . . . and feel pretty lonesome.

It has the constant gnawing knowledge that any mistake made on television is immediately visible in thousands of homes. It has the reassurance that most people seeing the mistake will smile and say: "Well, the guy's human." It has the certainty, too, that quite a few of the thousands seeing the error will grab postcards and start out a message with "you stupid bum, why did you . . ."

It has the sometimes embarrassing ability of making an ordinary fellow recognized and greeted by strangers on the street. You sneak into a burlesque theater, your collar turned up, only to be petrified by the doorman's ringing voice exclaiming, "Hey, ain't you Joe Smith I see on television?"

It has an uncanny ability to unmask the phony; of revealing the performer who thought, "I'll just ad lib my way through it. . . ." An unprepared individual—suddenly stabbed by the knowledge that he's looking straight into several thousand eyes, quite frequently is stricken dumb—with the forlorn expression of the fellow who was just sitting there reading the Sears and Roebuck catalogue when the tornado lifted the little house and carried it away.

It has the deceptive simplicity of a drape, a desk, and a couple of bright lights—with $40,000 worth of delicate electronic equipment glaring at you coldly and magnifying every wrinkle, every beard shadow, and every self-conscious smirk.

It is, in the words of Eric Sevareid, as easy as charting simultaneously the movements of each one of thirty-seven bats suddenly let loose in a closed room.

All you need in television is a thick skin—but sensitivity; an ingenious mind—but not too much imagination; courage—but no condescension; a warm personality—but no gush. That's all you need in television.

And all you need to climb Mount Everest is a pair of hobnail boots and a coil of rope.

Gene Godt
WCCO Radio and TV

THE ARCHITECT'S ROLE

"He who is his own lawyer has a fool for his client . . ." from a book of proverbial folklore published in 1875. That saying has been quoted many times in the past three quarters of a century and is heard frequently today.

This same book on proverbial folklore does not contain a familiar quotation that would apply to those people who would attempt to serve as their own architects. Perhaps the American Institute of Architects (the national organization of the architectural profession) should sponsor a contest that would produce a slogan comparable to the one that has been quoted so much by members of the legal profession. It would appear that there are more people today who feel qualified to serve as their own architects than those who would dispense with legal services.

Some doctors in their consideration of a building program fail to appreciate the contributions by architects. Often in the planning of small projects such as a residence or a small clinic, the M.D. puts his hands on pencil and paper and simply assumes he has "sufficient architectural tools" to proceed with a project. Perhaps this is due to the fact that architecture is a calling that brings out the "do-it-yourself" in many people. There are other fields that nonprofessionals assume they can enter with little education or experience. Journalism is one. Detective work is another.

A real understanding of the architect's role will point up the need for his services and why a doctor or any other potential building owner should engage an architect. Essentially, an architect seeks to achieve for his client a building which satisfies that old Roman definition of Vitruvius, "Well, building hath three conditions: firmness, commodity and delight." His first job is to understand purpose, requirements and limitations of structure which the client has in mind, then to combine those ideas with his own professional experience in planning and building. If the architect is consulted on a remodeling job, he inspects the building to be remodeled and advises as to the approximate realty value; practicality of making changes; present condition and quality of construction.

The architect visits the property, or if it has not been purchased yet, helps select it, budgets the cost.

Then he develops sketches of the structure, in rough form, showing size and arrangement of the rooms and general characteristics of the building. These preliminary drawings are examined and re-examined to be sure that the client understands what he is getting—in appearance and function.

Next, the architect prepares the working drawing of plans, elevations, sections and details which show construction and kind of material, together with notes and schedules. Drawings are also made of the plumbing, heating, air conditioning and electrical installations, of structural steel and reinforced concrete work. An architect's legal knowledge comes into play, for building codes must be considered, as well as other ordinances and regulations. He also writes the complementary specifications which establish the quality and assembly of every item going into the construction of the building, from foundation concrete to hardware. These drawings and specifications are the builder's

---

This is the second in a series of editorials on the subject of the architect.

guide, and when followed, the building will be as the client and the architect planned it.

The architect then helps choose contractors who bid on the work and who have made cost estimates from the architect's plans and specifications. The architect recommends the final selection of the contractor; assists in preparation of contract agreements which define general conditions, contract price, time limitations, manner of payment to the contractor, et cetera.

As construction proceeds, the architect makes periodic inspections of the work to see if it is being erected in full compliance with drawings and specifications. As the contractor sends in his bills, the architect keeps a running account of the cost of the building and certifies payments to the contractor.

When the project is finished, all required tests made, and the usual guarantees received from contractors, his normal services as architect have been completed.

Throughout planning and execution of the structure, it is the architect's obligation to know the intricacies of approximateely 125 trades which confront him daily. Particularly on large projects, he co-ordinates the techniques of other specialists and consultants; the structural, mechanical, electrical, acoustical, and civil engineers; landscape architect; kitchen, hardware and laboratory equipment consultant; lighting and color consultants. Many members of these related fields devote their entire professional lives to co-operation with architects.

An appreciation of the architect's services is the most cogent reason for retaining those services.

Robert E. Howe, A.I.A.
Associate Architect
Haarstick Lundgren & Associates, Inc.

A good college health program consists of far more than caring for the immediate needs of sick and injured students and teaching them good health habits. It has the responsibility of preventing illness or injury when possible, keeping aware of sanitary and environmental conditions that may be harmful and making appropriate recommendations, serving as an educational center for dissemination of information that may favorably affect the health of the community, and referring patients to specialized services when needed.—Dana L. Farnsworth, M.D., Bulletin NTA, May, 1956.

ORGANIC CARDIOVASCULAR DISEASE

(Continued from Page 744)

A second and more important manifestation of a functional reaction is present in the form of a nervous or functional superstructure imposed upon true organic hypertension. It is impossible to be certain, from the blood pressure figure alone and an isolated observation, how serious the underlying permanent hypertension is. The following facts must always suggest that the sphygmomanometer figures in such a case have greatly exaggerated the severity of the underlying disease—the presence of considerable tachycardia at the time of the examination, other evidences of nervousness in the patient, a perfectly normal cardiogram with upright T waves in the left ventricular leads, and R waves that are of normal amplitude, a normal or even a small vertical cardiac silhouette on x-ray screening, normal retinal arteries free from shininess, diminution in size, irregularity, tortuosity, and arteriovenous nipping.

In such people the hypertension is probably mild or benign. Such a conclusion is reinforced if the findings remain unchanged at subsequent examinations made at long intervals of time. Indeed, it is often found that the figures which were high at the time of the first examination remain subsequently at a considerably lower level.

GENESIS OF INTESTINAL ATRESIA

(Continued from Page 745)

distal to the infarcted area was normal but completely collapsed. The infarcted segment was found collapsed in various stages of disintegration, depending on how soon the puppy was born after the interference with the ileal blood supply. In the puppies born more than ten days after surgery, the infarcted bowel was entirely represented by a fibrious strand. An anomaly of the gut identical with that found in infants with ileal atresia resulted.

These successful experiments, together with the other observations, constitute some proof that at least a certain number of intestinal atresias are due to a vascular accident causing infarction of a segment of the foetal bowel and absorpation of the affected segment resulting in atresia.

President's Letter

CONTINUED SUPPORT FOR AMERICAN MEDICAL EDUCATION FOUNDATION

Yes, I did write a president's letter on the American Medical Education Foundation for the April issue of MINNESOTA MEDICINE. Our 1956 solicitation for contributions is under way now, and I feel it is so vital that we improve our giving that I want to use this opportunity to re-emphasize it.

Dr. Herman Drill, as general chairman of the State Committee in 1955, did an excellent job in organizing the State into local component society committees, working under an executive committee of one member from each councilor district. As a result of the effort put forth in 1955, $28,313.75 was contributed by Minnesota doctors, as compared with $5,890.38 in 1954. As a result of the success of his plan, Doctor Drill was asked to speak at the 1956 State Chairman's Conference in Chicago last February. In his report, Doctor Drill attributed the success of the Minnesota campaign to repeated committee meetings with county and district chairmen and the quick elimination of committee members who were not active. This stresses the importance of an active functioning committee on the local level. The enthusiasm of the local committee will inspire the membership. Dr. Charles Rea, as state chairman, is a worthy successor to Doctor Drill.

Several county societies, I believe, deserve special mention for their accomplishments. McLeod County had 100 per cent participation and reached over 95 per cent of its stated goal. Other counties rating high individual membership participation were Blue Earth, Waseca, Wabasha, Steele, Goodhue, and Blue Earth Valley Society.

Our eighty-one medical schools are all suffering from lack of funds. In the tax-supported schools, such as Minnesota, all their tax funds are earmarked for specific purposes, salaries are fixed, research is limited by a strict budget. The mounting costs of education have hit the privately endowed schools also. Ten million dollars additional annually is needed for the medical schools to continue their research, keep their salaries up to where they will not be losing valuable men by salary budget limitations.

Unless private contributions from the doctors of the nation, from industry interested in medicine, and community-minded citizens are forthcoming to meet these needs, the schools will be forced into accepting federal grants. Federal grants mean federal control, another step toward socialization, and it seems that I recall we have been fighting socialization of medicine for some time.

Every medical school desperately needs unrestricted funds that can be called upon for research, equipment, and salaries that are not provided for in a rigid budget.

Have you missed the nominal contribution you made last year? Can you even recall what you gave last year? Would you suffer too much if you doubled it this year, so we could really point to our record with pride?

We are proud of the medical institutions in Minnesota. Let's make the medical institutions of Minnesota and the nation proud of us as Doctors of Minnesota.

R. H. Wilson

President, Minnesota State Medical Association

Medical Economics

Edited by the
Committee on Medical Economics,
Minnesota State Medical Association
George Earl, M.D., Chairman

NEW POLL REVEALS PHYSICIANS' OPINIONS ON SOCIAL SECURITY

Many state medical associations, including Minnesota, have conducted polls to determine physicians' attitudes on Social Security. Until recently, when the magazine *Medical Economics* undertook a new survey, no major poll had narrowed the respondents' choice to just two possibilities: *compulsory* or *no* coverage. Given this choice, here is how a representative cross-section of physicians say they would decide: 59.8 per cent favor *no* coverage and 40.2 per cent favor compulsory coverage. Those favoring compulsory coverage include, generally, men with gross earnings around the $10,000 level; men in cities of 500,000 or more population and men who specialize in dermatology or psychiatry. (Psychiatrists favor compulsory coverage by a 64 per cent majority—the highest for any category.)

In contrast, opposition to compulsory coverage is strongest among these groups: men who have been in practice less than ten years, men with gross incomes of $40,000 or more a year; men in towns with less than 25,000 population and men who specialize in orthopedic surgery.

A convincing article on "Social Insecurity—the Trap Awaiting the Young M.D." appeared on page 231 of the September 15, 1956, issue of the *Journal AMA*. Physicians are urged to read this article which is the first part of a two-part article. The second part will appear in a subsequent issue of the *Journal*.

Refunds

A refund you get of an overpayment on your state income tax may have to be reported as income on your federal tax return. That is spelled out by the Internal Revenue Service in a new ruling. If you included the state tax in itemizing deductions on your federal return, you must report as income the amount of the refund that equals the tax benefit you received. If, however, you used the standard deduction, or the federal return short form on which your tax is figured for you from tables, you need not report the refund.

Contributions to Colleges

An alumni association of the college you attended may qualify as an organization operated for educational purposes, the federal tax collector rules. If so, contributions you make to the association would be deductible for income tax purposes. The association must be under direct control of the school, and the payments you make must be outright contributions—not alumni dues for which you receive some benefit in return.

Medical Travel Expenses

The Internal Revenue Service is not softening its stand against deductibility of medical travel expenses. Its latest ruling involves a person suffering from a serious illness whose condition was worsened by worry over a family member injured in an accident. On medical advice, this person made trips to Florida and California "for a complete change of environment and living conditions." Subsequently, a ruling was requested as to whether travel costs came under healing of medical care.

The ruling stated that "expenses which were merely for a change in the patient's environment or the improvement of his morale and the general mitigation of his condition, which might result from a general improvement in his health, are not amounts paid for medical care. Accordingly, such expenses may not be taken into consideration in determining the amount of a deduction for expenses paid for medical care."

Hospital Costs, Services to be Studied

Ray E. Brown, president of the American Hospital Association, announced recently that it was costing 116 per cent more to care for hospital patients now than it did ten years ago. Expenditures for a patient-day in all types of hospitals rose from an average of $5.21 to $11.24 between 1946 and 1955. The same report indicated a 34 per cent increase in hospital admissions and a rise of 63 per cent in hospital births during the last ten years.

Now the AMA is about to launch a study to learn what the hospital patient gets for his money.

It will be the second phase of a three-part, five-year study measuring the medical services given to the American people by their physicians. The survey, which will cost about $100,000 when completed, is the first of its kind—measuring services and not money spent.

The results, which will be published late in 1958, may help bring about changes in hospital construction, medical education, health insurance rates and other health care matters. Questionnaires have been mailed to 7,000 hospitals to learn the age, sex, length of stay and diagnoses for every hospitalized person discharged during the third week of October, 1956.

This current questionnaire will help answer such questions as "Which ailments or conditions are sending most Americans to hospitals, which are keeping them there the longest; how many beds are taken up by accidents casualties, by pregnant women, by patients undergoing non-emergency surgery?"

WHAT AMERICANS SPEND FOR MEDICAL CARE

The average American family spends 4 to 5 per cent of its yearly income for medical care and related services. For the nation, the total spent on personal health services—either as out-of-pocket expenditures by the family or by prepayment for those having such protection through Blue Cross, Blue Shield or insurance companies—was $10.2 billion in 1953, a recent survey shows. This contrasts with the $11.8 billion spent for recreation; $14.2 billion spent for alcoholic beverages and tobacco and $23.6 billion for private automobile purchase and maintenance.

LEGISLATION OUTLAWING DANGEROUS CHEMICALS PROPOSED

The AMA Board of Trustees has authorized the Committee on Toxicology to proceed with plans for the drafting of proposed legislation which would require labeling of dangerous household and commercial chemicals.

The action was prompted by the growing need for model legislation requiring precautionary labeling of those chemical products considered potentially harmful. There are many such products universally used which contain possibly harmful ingredients. Purpose of the proposed legislation is to reduce careless and ignorant handling and storage of chemicals found in and around the home. Any proposed legislation should require informative labeling on household chemical items, including listing of possibly harmful ingredients, their potentialities for harm, their directions for safe use and first aid instructions for poisoning emergencies.

NEW SURGEON GENERAL

Dr. Leroy E. Burney has been sworn in as the eighth person to hold the title of Surgeon General in the United States Public Health Service. His appointment will be sent to the Senate in January for confirmation. For the past two years, Doctor Burney has been Deputy Chief of the Bureau of State Service of the Public Health Service. He succeeds Dr. Leonard A. Scheele.

LEADERS PREDICT FUTURE OF MEDICAL PRACTICE

A forecast of the practice of medicine in 1966 by 400 of the country's medical leaders included these predictions:

"Because of the relative decline of the solo practitioner, by 1966 most practitioners may be won over to some form of group or partnership practice."

The forecasts goes on to state that "the malpractice problem will be worse before it gets better, but it will get better. By 1966 physicians will be better trained; they will keep better records and they will get more help from their medico-legal committees."

Between 80 and 85 per cent of the population will "have some kind of health insurance coverage" by 1966. The prediction is that the enactment of compulsory health insurance seems unlikely "barring a stiff depression. What is more likely is that voluntary plans will offer 'full-service coverage' without income ceilings in almost all parts of the country."

"There will be more hospitals with entirely salaried staffs and staff members may be subject to an increasing degree of regulation. Many physicians will be likely to affiliate with only one hospital—and be obliged to attend the meetings of only one staff."

The forecast includes the prediction that medical schools will be turning out a larger percentage of G.P.'s by 1966 than at any time since the early thirties.

The three specialties likely to undergo the biggest changes are internal medicine, psychiatry, and medical nuclear physics.

The leaders questioned stated that they believe "internists will probably serve as family doctors; the increasing tempo confusion and frustration of modern living will make psychiatric expansion inevitable, and medical nuclear physics will show a fantastic growth.

FEDERAL GRANTS FOR MEDICAL RESEARCH

Institutes Receive Increases

If medical research doesn't move ahead in the current fiscal year (ending June 30, 1957), it won't be the fault of Congress. The seven research organizations that make up the National Institutes of Health have far more money than they have ever had, and probably much more than their directors even dared hope for last winter at the start of hearings on their budgets. Every one of the research institutes received a substantial increase over last year, and the funds of five of them were almost doubled.

The Institutes have a total of $170.4 million to spend before next July 1. This is about 80 per cent more than they had last year. In discussing the appropriations bill on the Senate floor, Senator Lister Hill (D., Ala.) said the bulk of the money will go for grants to non-federal institutions—hospitals, medical schools, clinics and state and local organizations engaged in research.

A breakdown by disease categories shows the following picture:

For cancer research, $48.4 million, in contrast to $24.8 million for the previous year. This year's total is $16 million more than the administration asked when budget requests were sent to Congress in January.

For mental health work, $35.1 million, in contrast to last year's $18 million. This is $13.4 million more than had been requested originally.

For heart disease research, $33.3 million, compared with $18.7 million last year and $22.1 million originally requested.

For work on arthritis and metabolic diseases, $15.8 million, or $5.1 million more than last year and $2.5 million more than Congress was asked for.

For research in neurology and blindness, $18.6 million, compared with $9.8 million last year and $12.1 million originally requested.

For work on allergies and infectious diseases, $13.2 million, compared with $7.5 million last year and $9.7 requested.

For dental research $6 million. While this is small compared with money voted for other U. S. research institutes, it is almost triple the $2.1 million spent last year. The huge increase is the result of a sustained campaign by the American Dental Association.

First Grants Under New Research Construction Law Announced

Four medical schools, a hospital and a research center are recipients of the government's first grants under a new law authorizing 50-50 matching funds for support of medical research construction and equipment.

Initial awards totaled $765,159 with the University of Minnesota receiving $187,110 for two projects. Other recipients include Georgetown University, the University of Pennsylvania, Albany Medical College, Massachusetts General Hospital and Christ Hospital Institute.

SUPREME COURT TO REVIEW NUMEROUS MEDICAL CASES

The U. S. Supreme Court opened its 1956-57 session in October with a number of medical cases among those it is being asked to review. Some of these include:

1. Does the taking of a blood specimen for the purpose of sobriety test from an unconscious person constitute denial of due process of law?

2. Alleged denial of due process is also the basis of a case involving a state's right to exclude naturopathy from licensure as a healing art.

3. Is the Federal Food and Drug Act "too vague and indefinite"? This is based on a case of a Florida druggist convicted of selling a habit-forming drug without a prescription.

4. Fraud, deceit, misrepresentation were employed by a government agent who obtained evidence leading to his conviction of prescribing narcotics to a person not under his medical care, according to an osteopathic physician who is petitioning for review.

There is a general reluctance on the part of elderly men to submit to medical examination, especially if it means going to a clinic or hospital. They will more readily call in the doctor or go to the general practitioner's surgery; old people do not look with much favor on a visit to the mass radiography service.—F. R. G. Heaf, M.D., J. Royal Inst. Pub. Health and Hygiene, Nov., 1955.

Meetings and Announcements

MEDICAL MEETINGS

STATE

MINNESOTA STATE MEDICAL ASSOCIATION, 104th annual meeting, Saint Paul, May 13, 14 and 15, 1957.

Mediclinics of Minnesota, Fort Lauderdale, Florida, March 4-14, 1957.

For information write 516 Medical Arts Building, Minneapolis 2, Minnesota.

NATIONAL

American College of Surgeons, sectional meeting, Hotels Lowry and St. Paul, St. Paul, Minnesota, April 8-10, 1957. Write Dr. H. Prather Saunders, Associate Director, American College of Surgeons, 40 East Erie St., Chicago 11, Illinois.

Centennial Exposition, Academy of Medicine of Cincinnati, Health Museum, Cincinnati, Ohio, February 27-March 5, 1957.

Centennial Exposition, 100th anniversary of the Academy of Medicine of Cincinnati, Music Hall, Cincinnati, Ohio, February 27-March 5, 1957.

Milwaukee Academy of Medicine, symposium on immunology, Marquette University Brooks Memorial Union, Milwaukee, Wisconsin, December 1.

INTERNATIONAL

Pan American Congress on Cancer Cytology, Miami, Florida, January 8-12, 1957. Dr. J. Ernest Ayre, chairman, 1155 N. W. 14th St., Miami, Florida.

Pan-Pacific Surgical Association, seventh congress, Honolulu, Hawaii, November 14-22, 1957. Write Dr. F. J. Pinkerton, director-general of the Pan-Pacific Surgical Association, Room 230, Young Building, Honolulu, Hawaii.

AERO MEDICAL ASSOCIATION

Medicine in the jet-atomic age of flight will be the central theme of the 28th annual meeting of the Aero Medical Association at the Shirley Savoy Hotel in Denver, May 6-8, 1957, under the presidency of Dr. Jan H. Tillisch, Rochester.

The scientific program will include reports on emergency escape from high performance aircraft, new developments in airline passenger comfort and safety, and current research in manned space satellites. The American Board of Preventive Medicine will conduct examinations for certification in aviation medicine in Denver from May 3 to 5.

Dr. Nolie Mumey, Denver, is general chairman of the meeting. Speakers desiring to participate in the scientific sessions should send the title of the proposed paper and a 150-word abstract prior to December 1 to Dr. E. J. Baldes, chairman of the Scientific Program Committee, Mayo Clinic, Rochester, Minnesota.

WORLD MEDICAL ASSOCIATION PLANS SECOND CONFERENCE

The Second World Conference on Medical Education, sponsored by the World Medical Association, will be held in Chicago, Illinois, August 30 to September 4, 1959. Object of the conference will be to exchange information to assist in raising the standards of medical education of the world. Deputy president of the organization is Dr. Victor Johnson, director of the Mayo Foundation for Medical Education and Research, University of Minnesota Graduate School.

MEDICAL CONTINUATION COURSES

The following courses will be presented at the Center for Continuation Study, University of Minnesota.

November 5-9—Radiation Therapy for Radiologists
November 19-21—Fractures for General Physicians
December 6-8—Physical Medicine for Specialists
January 3-5—Urology for General Physicians
January 7-9—Dermatology for General Physicians
January 31-Feb. 2—Emergency Surgery for General Physicians

For further information, write to the Director, Department of Continuation Medical Education, 1342 Mayo Memorial, University of Minnesota, Minneapolis 14.

NEW ORLEANS GRADUATE MEDICAL ASSEMBLY

The twentieth annual meeting of the New Orleans Graduate Medical Assembly will be held March 11, 12, 13 and 14, with headquarters at the Municipal Auditorium in New Orleans.

Eighteen guest speakers will participate. The program will include fifty-four informative discussions in addition to clinicopathologic conferences, symposia, scientific exhibits, medical motion pictures, round-table luncheons and technical exhibits.

A postclinical tour will follow the meeting. On March 16 a party composed of doctors and their families will leave from New York for the Mediterranean and Europe via plane. The itinerary includes France, Greece, Turkey, Egypt, Jerusalem, Lebanon, Syria and Italy. Arrangements have been made for medical programs in the places visited. The official tour terminates in Rome on April 12, but arrangements may be made for independent travel to any points in Europe desired.

Details of the New Orleans meeting and the postclinical tour are available at the office of the Assembly, Room 103, 1430 Tulane Avenue, New Orleans 12, Louisiana.

Woman's Auxiliary

TWO MINNESOTA OFFICERS ATTEND CHICAGO CONFERENCE

Mrs. L. P. Howell, Minnesota Auxiliary president, and your president-elect, attended the 13th annual conference for Auxiliary presidents and presidents-elect at the Drake Hotel in Chicago October 1, 2 and 3. The conference theme this year was "Health Is Our Greatest Heritage."

The first two days were devoted to panel discussions on major Auxiliary interests: AMEF, Civil Defense, Safety, Recruitment, Program, Organization, Public Relations, Legislation (a review of legislation passed by the 84th Congress), *Today's Health* and *The Bulletin*. There was also a history report and a humorous panel on finance.

The national committee chairman acted as moderator for the panel which concerned her particular field of work, and the panel speakers included state presidents and other experts (physicians and members of the AMA staff) who sumed up material, added information and answered questions.

The panel on Program, in which Mrs. Howell ably participated, included a discussion on how state presidents can strengthen the Auxiliary program.

Some new ideas on rehabilitation at the community level were suggested by Dr. Ralph E. DeForest, secretary of the AMA Council on Physical Medicine and Rehabilitation.

Dr. Irene Josselyn, who participated in the Mental Health Panel said, "We do not know how much mental illness we can prevent, but the more that we can do to relieve the strain on children, the more we can hope it will prevent breakdowns later." She stressed that the hidden cost of disturbed children is much more than the cost of treatment; she also warned that child guidance clinics should be a medical organization under a psychologist trained in child psychology and to start a clinic only on the level where you have trained personnel to carry on. We can prepare the community to understand that a child who has difficulty growing up may need treatment.

Very impressive was the legislative panel and the five state presidents who, in three minutes each, gave fine summaries of some of the controversial bills of the 84th Congress. Mr. C. Joseph Stetler, Director of the AMA Law Department, summed up this discussion and said that he expects many more bills affecting the practice of medicine to come up in the next session of Congress. He warned that unless physicians as individuals wake up to what is going on in Washington that many more inroads into medical controls can be expected. He stressed the importance of selecting and appointing capable legislative officers. There will be available to the Auxiliary five or six bills for study and he urged us to be sure our husbands studied them, too.

Dr. Horace Campbell, Denver, a member of the AMA Committee on Medical Aspects of Automotive Injuries and Deaths, suggested that we should change our ideas on safe driving and preventing accidents because one-half of the cars now on the road will be involved in accidents before they are junked; so safe driving instruction has not halted the traffic toll. Therefore, he believes we should demand safer cars equipped with energy-absorbing material. These have been studied and are practical. Dr. Campbell also said these cars will be manufactured only if it is assured that they will sell and it is the women who can set the style, and demand and create the market for these safer cars.

The conference was not without its lighter side. A woman from Missouri found herself wearing the same hat as the president of the Idaho Auxiliary. She changed her hat the next day only to find that the National Treasurer from Montana was wearing an identical copy.

Perhaps this dilemma gave Dr. David Allman, president-elect of the AMA, the theme of the talk he gave at lunch on Tuesday. He suggested that we should all have "B's in our Bonnets": **Barnstorming**, to get down to the grass roots and community level: **Broadcasting** medicine's wonderful story and learning the functions of the AMA: **Buttonholing** and correcting misinformation, and **Blazing** new trails in service in medical fields.

Never was the value of our Auxiliary and its program questioned. We were accepted and welcomed as part of the medical team. Nowhere was this more evident than on Wednesday when we were taken on a tour of the AMA building where the various offices and functions were explained to us. The scope of the activity in which the AMA engages to protect our doctors and their profession is awe inspiring.

There were many suggestions for programs on the community level and in order to keep more government out of medicine, Auxiliary members are urged to meet the needs of their locale and educate themselves and other people about the cost and calibre of government medicine.

(Mrs. C. L.) Helen Oppegaard
President-elect, MSMA Auxiliary

AUXILIARY MEMBERS ENTERTAINED AT NORTHERN, SOUTHERN MEETINGS

The September meetings of the Northern and Southern Minnesota Medical Associations, held in Alexandria and New Ulm respectively, included activities for wives of the physicians who attended.

Mrs. L. P. Howell, state Auxiliary president, was present at both meetings. The Northern group met September 7 and 8, and thirty-six women attended a luncheon at which both Mrs. Howell and President-elect Mrs. C. L. Oppegaard, Crookston, spoke.

That evening, after the banquet, Dr. and Mrs. Corrin H. Hodgson, Rochester, presented an interesting program on their recent trip to Africa. They showed and narrated a film which they said they would be glad to present before other groups, as many as they can accommodate.

Members of the Brown County Medical Auxiliary entertained the wives of physicians who attended the Southern Minnesota meeting September 10. The day began with registration, followed by a coffee party at the summer home of Dr. T. R. Fritsche. Later local hostesses served as chauffeurs for a tour of the city. A luncheon for forty, followed by a style show, was enjoyed at noon. Mrs. Howell also gave a short talk at this luncheon. In the evening, the women joined their husbands for a social hour and banquet.

ANNUAL SCHOOL OF INSTRUCTION ATTRACTS LARGE TURN-OUT

The 1956 School of Instruction for state and county Auxiliary officers and committee chairmen attracted nearly 100 women from all over the state. The successful "school day" was held Tuesday, October 9, at the Curtis Hotel in Minneapolis. After a meeting of the board, the program opened with a "Panel on Auxiliary Projects." Mrs. W. E. Wellman, Rochester, discussed AMEF; Mrs. H. P. VanCleve, Austin. *Today's Health*, and Mrs. E. H. Soule, Rochester, stressed the importance of "Recruitment." The second panel included six speakers on "Program Planning for the County Meeeting." Mrs. O. M. Heiberg, Worthington, talked on "Use Your Tools"; Mrs. William Gjerde, Lake City, spoke on "New Developments in the Mental Health Field," "Care of the Aging" was stressed by Mrs. Reuben Erickson, Minneapolis. Mrs. Lyle French, Minneapolis, described "A Health Day with Public Appeal"; Mrs. M. I. Hauge, Clarkfield, presented "Handling the Mail" and Mrs. Charles Merkert, Minneapolis, suggested making use of current literary material on medicine as program material.

Highlight of the luncheon was a most enlightening talk on Russia and life of Russian women and children by *Minneapolis Tribune* columnist George Grim. Dr. R. H. Wilson, Winona, brought greetings as president of the state medical association and Harold Brunn, assistant executive secretary of the state medical association, discussed legislation.

The program closed with the new AMA film, "The Case of the Doubting Doctor," which was introduced by Mrs. H. E. Bakkila, Duluth.

* * *

Contributions for this column, including news and activities of State Auxiliary societies and items of interest about members, may be sent to Mrs. A. B. Rosenfield, Woman's Auxiliary Editor, MINNESOTA MEDICINE, *2920 Dean Boulevard, Minneapolis, Minnesota.*

In Memoriam

GLENN P. SCHMITZ

Dr. Glenn P. Schmitz, Little Falls physician, died September 26, 1956, at the Variety Club Heart Hospital, Minneapolis. He was thirty-seven years old.

Born in Ogema, Minnesota, April 13, 1919, Dr. Schmitz graduated from St. John's University, Collegeville, Minnesota, and completed his medical education at St. Louis University, St. Louis, Missouri. He interned at Wheeling Hospital, Wheeling, West Virginia, and then spent two years in the United States Army. He practiced at Holdingford, Minnesota, for one year and moved to Little Falls in 1948. He was a member of the staff of St. Gabriel's Hospital, Little Falls, the Upper Mississippi Medical Society, the Minnesota State Medical Association and the American Medical Association.

Dr. Schmitz is survived by his mother; Mrs. Clara Schmitz, Little Falls: two children, Steven, eight, and Laurie, ten, both of Topeka. Kansas; a brother, Dr. E. J. Schmitz, U. S. Naval Hospital, Great Lakes, Illinois; and a sister, Mrs. S. D. Battaglia, San Jose, California.

WILLIAM G. STROBEL

Dr. William G. Strobel, Duluth physician for thirty-five years. died September 20, 1956. He was seventy years old.

A native of Mankato, Minnesota, Dr. Strobel was former chief of staff of St. Mary's Hospital, Duluth, and was associated with the Duluth Clinic.

He graduated from the University of Minnesota and from Rush Medical School, Chicago, Illinois, and interned at Cook County Hospital, Chicago, and St. Luke's Hospital and Mounds Park Sanatorium, St. Paul. He was resident physician at the Faribault School for Retarded Children and practiced at Welcome, Minnesota, from 1914 to 1920.

A charter member of the Duluth Surgical Society, Dr. Strobel was also a member of the St. Louis County Medical Society. Other memberships included the Interurban Medical Society, the American College of Surgeons, the American Proctologic Society and the International Society of Gastorenterology and Proctology.

He also served on the staffs of St. Luke's Hospital and Miller Memorial Hospital, Duluth, and was active in the Glen Avon Masonic Lodge AF and Am, was a 32nd Degree Mason and a member of the Duluth Scottish Rite bodies. He also belonged to the Twin Cities unit of the Shrine Crippled Children's Hospital.

Survivors include his wife, Alice; three daughters, Mrs. Herbert Burns and Mrs. Hubert Wheeler, Duluth. and Mrs. Robert White, Arlington Heights, Illinois, and ten grandchildren.

NEW AND IMPORTANT

ROLICTON*

(BRAND OF AMINOISOMETRADINE)

Simple b.i.d. Dosage for Positive Diuresis

THE GLOMERULAR FILTERING SYSTEM
Configuration of the renal glomerulus as revealed by the electron microscope.

(illustration by Hans Elias)

THIS newest product of Searle Research is the only *continuously effective* oral diuretic that avoids *all* these disadvantages:

... Significant side effects
... Complicated dosage schedules
... Electrolyte disturbance
... Acid-base imbalance
... Fastness
... Known contraindications

ROLICTON has been found effective as an agent to eliminate, or greatly reduce the frequency of, mercurial injections.

DOSAGE IS SIMPLE. One tablet b.i.d. is usually adequate, following administration of four tablets the first day. G. D. Searle & Co., Chicago 80, Illinois. Research in the Service of Medicine.

*Trademark of G. D. Searle & Co.

SEARLE

General Interest

The Southern Minnesota Medical Association held its meeting September 10, in New Ulm. **Dr. Charles F. Stroebel**, Rochester, was elected president; **Dr. Leo Prins**, Albert Lea, and **Dr. William Finkelnburg**, Winona, vice presidents, and **Dr. G. R. Diessner**, Rochester, secretary-treasurer.

* * *

Dr. E. H. Lambert and **Dr. L. D. Amick**, Rochester, attended the meeting of the American Association of Electromyograph and Electrodiagnosis, September 9-14, in Atlantic City, New Jersey. Both presented papers. Dr. Lambert is a vice president of the association.

Rochester physicians who presented papers at the Clinical Congress of the International College of Surgeons in Chicago recently included **Dr. J. A. Bargen, Dr. V. S. Counseller, Dr. R. J. Jackman** and **Dr. G. J. Thompson.**

* * *

Several Minnesota physicians were among the 1956-1957 officers elected at the recent meeting of the American Congress of Physical Medicine and Rehabilitation. **Dr. Frederic J. Kottke**, Minneapolis, is second vice president; **Dr. Donald J. Erickson**, Rochester, is fourth vice president. **Dr. Frank H. Krusen**, Rochester, was elected treasurer.

Dr. Miland E. Knapp, director of Physical Medicine and Rehabilitation of the Kenny Institute, Minneapolis, was awarded the Gold Key of the congress for the work he has done in developing methods of treatment of poliomyelitis.

* * *

Dr. Gordon Franklin, Northome, was honored at a dinner in Bemidji in September by representatives of the Sears-Roebuck Foundation. This foundation extended a loan to Dr. Franklin for a clinic building which is now under construction in Northome.

* * *

Dr. Edgar V. Allen, Rochester, was installed as president of the American Heart Association at its 29th annual session October 26 in Cincinnati. He succeeds **Dr. Irvine Page** of Cleveland. **Dr. Allen, Dr. Howard B. Burchell** and **Dr. Grace Roth**, all of Rochester, led several discussions at the meeting, and **Dr. Jesse E. Edwards**, Rochester, delivered the Lewis Conner Memorial Lecture. His topic was "Functional Pathology of the Pulmonary Vascular Tree in Congenital Cardiac Disease."

* * *

Lt. Col. **John P. Stapp** spoke on "Crash Survival Research, Automotive and Aeronautical" at the fall meeting of the Minnesota Obstetrical and Gynecological Society, September 22, in Rochester. **Dr. Frederick Schade**, Worthington, was elected president of the society; **Dr. John McKelvey**, Minneapolis, vice president. **Dr. Edward A. Banner**, Rochester, was reelected secretary-treasurer, and **Dr. Louis Friedman**, St. Paul, was elected to the board of governors.

* * *

Dr. A. Miles Griffin, Oakland, California, presided at the 32nd annual meeting of the Alumni Association of the Mayo Foundation September 27-29. Dr. Griffin was a fellow of the Mayo Foundation from 1933 to 1937.

Officers elected at the reunion included **Dr. George E. Rice**, Pueblo, Colorado, president; **Dr. James F. Weir**, Rochester, first vice president; **Dr. George A. Lord**, Hanover, New Hampshire, second vice president; **Dr. George B. Logan**, Rochester, secretary-treasurer. **Dr. Donald C. Balfour**, Rochester, is honorary president of the Association.

The Howard K. Gray Memorial Fund traveling scholarship was presented to **Dr. Martin A. Adson**, Rochester, son of the late Alfred W. Adson, founder of the Section of Neurosurgery at the Mayo Clinic. As the recipient of the first scholarship in honor of Dr. Gray of Rochester, who died last year, Dr. Adson will spend approximately two weeks at leading surgical centers of the United States.

Dr. Milton Cooper, Bayonne, New Jersey, and **Dr. Rene Bois-Menguy**, Paris, France, received $150 each as the Alumni Award for Meritorious Research which was split between the two former fellows in the Foundation.

* * *

C. Richard Peterson, Jackson, and **Vincent R. Hunt**, Anoka, received Minnesota Medical Foundation scholarships at ceremonies October 1, in Mayo Memorial Auditorium, Rochester. **Dr. Wesley W. Spink**, professor of medicine at the University of Minnesota and foundation president, presented the awards. **Dr. William F. Maloney**, assistant dean of the University Medical School, reported on medicine and medical education in South Korea.

* * *

Dr. Austin C. Davis, a member of the staff of the Mayo Clinic for thirty-one years, retired from the active practice of medicine October 1. Dr. Davis devoted his career to internal medicine, with a special interest in diseases of the endocrine system. He did much original work on the thyroid gland and on the pituitary and suprarenal glands.

* * *

Dr. Richard M. Hewitt, Rochester, senior consultant in the Section of Publications of the Mayo Clinic and associate professor of medical literature in the Mayo Foundation, presided at the thirteenth annual meeting of the American Medical Writers Association in Chicago, September 28-29. Dr. Hewitt is president of the Association. Speakers from Minnesota at the meeting were Sylvia Covet, executive editor of *Postgraduate Medicine,* and **Dr. Arthur H. Wells**, Duluth, editor of MINNESOTA MEDICINE.

Dr. George G. Stilwell, Rochester, attended this meeting and the meeting of the American Society of Clinical Pathologists also held in Chicago October 7-13.

* * *

Dr. Thomas M. Rivers, New York, has been appointed medical director of the National Foundation for Infantile Paralysis succeeding **Dr. Hart E. VanRiper**. Dr. Rivers was formerly vice president of the Rockefeller Institute for Medical Research.

* * *

Dr. James Rogers Fox, Minneapolis, was chairman of the radio-television workshop at the AMA Public Relations Institute held in Chicago recently. Dr. Fox will be featured on a new radio series, "Doctor, Tell Me," which is being aired over a series of nineteen Minnesota radio stations. The weekly fifteen-minute program includes interviews with patients and physicians and is heard over KUOM, Minneapolis, at 11:15 a.m. Mondays; over KATE, Albert Lea, Wednesday, 7:00 p.m.; KCUE, Red Wing, Sunday, 7:15 a.m.; KMHL, Marshall, Sunday, 5:00 p.m.; KFAM, St. Cloud, Saturday, 9:30 a.m.; KXRA, Alexandria, Thursday, 7:00 p.m.; KBUN, Bemidji, Sunday, 8:15 p.m. Exact times and days for the remaining stations will be announced in the next issue of MINNESOTA MEDICINE. Minnesota physicians are urged to listen to this program regularly and to encourage listenership among their families, friends, neighbors and patients. The program series is sponsored jointly by the local radio station, the county medical society and the state medical association.

* * *

Four Tracy physicians attended a recent Lyon-Lincoln County Medical Society postgraduate study at Marshall, but none stayed long as all were called out for obstetrical cases. The four men, **Dr. R. R. Remsberg**, **Dr. W. G. Workman**, **Dr. S. J. Boyle** and **Dr. Norman Lee** missed hearing the guest speaker, **Dr. Alex Barno** of Minneapolis, whose topic was . . . "obstetrics."

* * *

The Southwestern Minnesota Medical Society held a joint dinner meeting with its auxiliary at Michael's Steak House, Worthington, September 24. Speaking before the society was **Dr. Edmund B. Flink**, chief of medical service at the Veterans Hospital, Minneapolis.

Mrs. Inez Madsen, Worthington, spoke before the auxiliary, which held its business meeting at the home of **Dr. and Mrs. O. M. Heiberg**, Worthington.

* * *

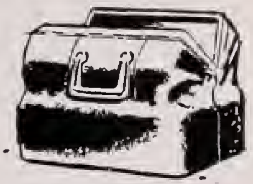
The next **Bahamas Medical Conference** will be held in Nassau, December 1-15, 1956. Special reduced hotel rates have been arranged for all Conference participants and their families. Reservations and travel arrangements are made through Allen Travel Service, Inc., 550 Fifth Avenue, New York 36. Registration fee for the Conference is $75. Organizing physician is **Dr. B. L. Frank**, Suite 1-3, 4th floor, 550 Fifth Avenue, New York 36.

THE YEAR BOOKS...

as traditional in medicine

as the

and



For more than half a century the annual Year Books have served the medical profession throughout the world. The Year Books help form the systematic, organized reading habits that do so much to compensate for lack of time. Their brief, concise style; their comprehensive coverage of world-wide journal literature; their authority and practical editorial evaluations; all add up to the ideal professional reading service—*the service offering the greatest amount of usable information in the least possible time, at lowest possible cost.*

Ask to see any of the New 1956-57 Series of Year Books

☐ Medicine, $6.75—*Just Ready*
☐ General Surgery, $6.75—*Nov.*
☐ Drug Therapy, $6.75—*Jan. '57*
☐ Pediatrics, $6.75—*Nov.*
☐ Obstetrics & Gynecology, $6.75—*Nov.*
☐ Eye, Ear, Nose & Throat, $7.00—*Jan. '57*
☐ Radiology, $9.00—*Dec.*
☐ Urology, $6.75—*Feb. '57*
☐ Orthopedics & Traumatic Surgery, $6.75—*Feb. '57*
☐ Neurology, Psychiatry & Neurosurgery, $7.00—*Feb. '57*
☐ Dermatology & Syphilology, $7.00—*Mar. '57*
☐ Endocrinology, $6.75—*May, '57*
☐ Pathology & Clinical Pathology, $7.00—*May, '57*

Year Book yb Publishers

5-11-56

THE YEAR BOOK PUBLISHERS, INC.
200 E. Illinois St., Chicago 11, Ill.

Please send on 10 days' approval the books checked above.

☐ Bill when shipped ☐ Remittance enclosed

Name________________________________

Street________________________________

City____________________Zone____State________

a potent germicide
For Cold Sterilization

Pheneen®

ULMER

ELIMINATES DOUBTFUL STERILITY
IN OFFICE USE . . .

Rapid germicidal activity plus specific sporacidal properties enable PHENEEN to provide the extra margin of safety during minor office surgery. Instruments may be stored for months in PHENEEN without weekly changes of solution. Special "built-in" rust inhibitant makes this possible. Routine use of colorless, odorless PHENEEN reduces questionable sterility to the minimum. For complete information and prices write . . . MM-1156b.

Physicians & Hospitals Supply Co.
1400 Harmon Place Minneapolis 3, Minn.

Lady M. Ethel Florey, an authority on antibiotics, visited the University of Minnesota in mid-October as the first stop of a tour of the United States to study the use of antibiotics. She was the guest of **Dr. W. W. Spink**, professor of medicine. The wife of **Sir Howard Flory**, co-winner of the Nobel prize with **Sir Alexander Fleming** for their development of penicillin, Lady Florey is a faculty member of the Sir William Dunn School of Pathology, Oxford University. She is the author of "The Clinical Application of Antibiotics."

* * *

Dr. H. B. Sweetser, Minneapolis, has been named by the Council of the Minnesota State Medical Association to be the ex-officio representative on the board of directors of the Minnesota Division of the American Cancer Society.

* * *

After completing a residency in obstetrics and gynecology at the University of Minnesota Hospitals, **Dr. Richard H. Leigh** has re-entered practice at the Leigh Clinic in East Grand Forks, Minn., and Grand Forks, N. D. He left practice in 1951 for two years of military service, after which he began his postgraduate specialty training. He is now associated with his father, **Dr. Ralph E. Leigh**, and brother, **Dr. James A. Leigh**.

* * *

The North Central Medical Center has been formed at Brainerd, with offices in the First National Bank Building. Staff members include **Dr. A. F. Dodson**, **Dr. J. E. Marvin**, **Dr. B. J. Hughes** and **Dr. J. B. O'Leary**.

* * *

Dr. Henry L. Williams, Rochester, was presented with an honor award for meritorious service at the second annual meeting of the American Rhinologic Society in Chicago, October 9-13. Among the speakers at the meeting, which was attended by more than 100 specialists, was **Dr. Harold S. Ulvestad** of the University of Minnesota, who spoke on the surgical phase of "Expanding Horizons in Rhinology."

* * *

A dinner party honoring **Dr. Edgar J. Huenekens** for his service to pediatrics and to the Minneapolis community was given on September 27 at the Calhoun Beach Hotel, Minneapolis. Members of the Minneapolis Pediatric Society sponsored the event, which was attended by more than seventy pediatricians. Dr. Huenekens, who began practice in Minneapolis as an intern at General Hospital in 1908, informed the group that he had no intention of retiring.

* * *

Dr. William F. Maloney, assistant dean of medicine at the University of Minnesota, will become dean of medicine at the Medical College of Virginia in Richmond on January 1. He has been assistant dean at Minnesota since 1953.

* * *

Three additional physicians have joined the consulting staff of the Long Prairie Memorial Hospital, Long Prairie, bringing the total to nine. The new staff members are **Dr. E. M. LaFond** and **Dr. H. M. Broker**, St. Cloud, and **Dr. G. M. A. Fortier**, Little Falls.

Dr. Nicholas J. Musty, Minneapolis, spoke on "Medical Aspects of Marriage" at a lecture series in the Catholic Youth Center, Minneapolis, on October 2.

* * *

Dr. William L. Benedict, Rochester, has been given a four-year appointment to the National Advisory Neurological Diseases and Blindness Council. His appointment was announced by Surgeon General **Leroy E. Burney** of the Public Health Service, U. S. Department of Health, Education and Welfare. Dr. Benedict is executive secretary-treasurer of the American Academy of Ophthalmology and Otolaryngology.

* * *

Dr. R. H. Wilson, Winona, president of the Minnesota State Medical Association, was a principal speaker at the annual school of instruction sponsored by the Woman's Auxiliary to the association in Minneapolis on October 9.

* * *

Dr. Grace Roth, of the Mayo Clinic, returned to Rochester in September from a tour of Europe, during which she presented papers at medical meetings in Brussels, Cambridge, Cologne and Stockholm.

* * *

Dr. Herbert M. Hirsch, assistant professor of cancer biology at the University of Minnesota, has received an $18,000 grant from the American Cancer Society and has been appointed a scholar in cancer research for three years.

* * *

New president of the Northwestern Hospital medical staff in Minneapolis is **Dr. Harold E. Miller**, succeeding **Dr. A. A. Zierold.** Other officers include **Dr. Richard E. Reiley**, vice president, and **Dr. Albert J. Schroeder**, secretary-treasurer.

* * *

Neurosurgical alumni of the Mayo Foundation honored **Dr. Winchell McK. Craig** and Mrs. Craig at a dinner in Rochester in mid-September. Dr. Craig, a senior consultant at the Mayo Clinic, has been with the clinic for thirty years. The neurosurgical alumni were holding their second annual reunion in Rochester.

* * *

Dr. David A. Boyd, Jr., of the Mayo Clinic and the American Board of Psychiatry and Neurology, was elected chairman of the board of St. John's Institute for Mental Health at its meeting on October 17. The Institute conducts a series of pastoral psychology workshops for clergymen of all faiths each summer. **Dr. C. J. Rowe**, Director of the Hamm Memorial Psychiatric Clinic, was elected secretary.

* * *

Dr. E. M. Hammes, Sr., Saint Paul, presented a paper on the subject, "Impartial Medical Testimony," at the meeting of the American Bar Association held in Baltimore, Maryland, October 11. He was also requested to speak on the activities of the **Medical Testimony Committee** of the Minnesota State Medical Association, of which he is chairman.

* * *

Dr. M. Duane Sommerness, Clinical Director of the Fergus Falls State Hospital, Fergus Falls, Minnesota, who has been an employee of the Minnesota Depart-

Now Available!

1957 Physicians

Daily Record Book

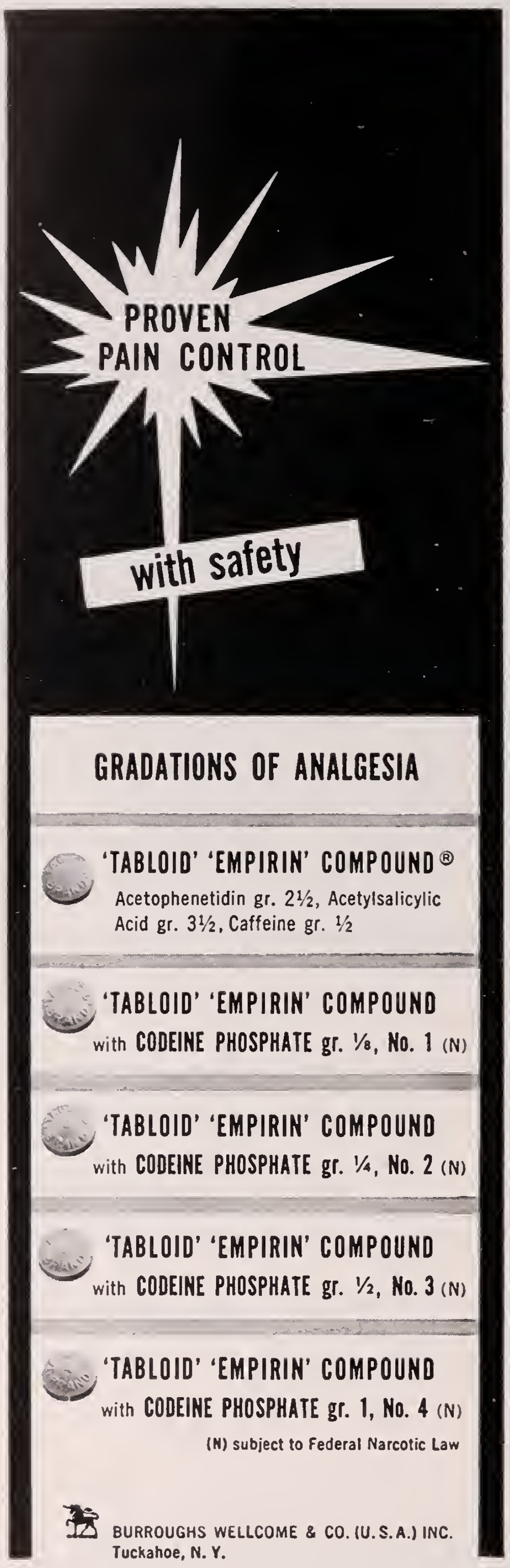
PHYSICIAN'S
DAILY RECORD

NOW IS THE TIME to order your 1957 Daily Record Book . . . the most practical and easy-to-use financial book for your medical records.

Our Daily Record Book is simple . . . easy to use . . . enables you to keep your financial records up-to-date for quick reference and provides a clear-cut record of your year's business for income tax reports.

When ordering the Physicians Daily Record Book, specify number . . . MM-1156a.

Physicians & Hospitals Supply Co.
1400 Harmon Place Minneapolis 3, Minn.



PROVEN PAIN CONTROL

with safety

GRADATIONS OF ANALGESIA

'TABLOID' 'EMPIRIN' COMPOUND®
Acetophenetidin gr. 2½, Acetylsalicylic Acid gr. 3½, Caffeine gr. ½

'TABLOID' 'EMPIRIN' COMPOUND
with CODEINE PHOSPHATE gr. ⅛, No. 1 (N)

'TABLOID' 'EMPIRIN' COMPOUND
with CODEINE PHOSPHATE gr. ¼, No. 2 (N)

'TABLOID' 'EMPIRIN' COMPOUND
with CODEINE PHOSPHATE gr. ½, No. 3 (N)

'TABLOID' 'EMPIRIN' COMPOUND
with CODEINE PHOSPHATE gr. 1, No. 4 (N)

(N) subject to Federal Narcotic Law

BURROUGHS WELLCOME & CO. (U.S.A.) INC.
Tuckahoe, N. Y.

ment of Welfare for the past four years, has been appointed Superintendent of the Traverse City State Hospital, Traverse City, Michigan, where he assumed his duties on November 1.

* * *

Dr. **J. S. Blumenthal**, Associate Clinical Professor of Medicine and Chief of Allergy Clinic, University of Minnesota, addressed the scientific meeting of the Ingham County Medical Society at Lansing, Michigan, on October 16, 1956. The subject was "Some Newer Concepts in the Treatment of Allergic Diseases."

NEW LOCATIONS

Dr. **John S. Huff**, who recently completed a tour of duty with the Air Force, has joined the staff of the Owatonna Clinic, Owatonna.

* * *

Dr. **L. E. Steiner**, after two years of service in the U. S. Navy, has returned to Albert Lea and has rejoined the Medical Center there.

* * *

Dr. **Richard B. Ellingson**, who recently completed his internship at Meadowbrook Hospital, Hempstead, Long Island, New York, has become associated in practice with Dr. **Theodore O. Wellner** in Rochester.

* * *

Dr. **Daniel Hanson**, formerly with the Public Health Service at Chicago, Illinois, has become associated in practice with Dr. **Carl Heinzerling** at Chaska.

* * *

Dr. **John J. Muller**, formerly of Buffalo, New York, has become a member of the surgical staff of the Adams Clinic at Hibbing.

MINNESOTA BLUE CROSS-BLUE SHIELD

Approximately $15.442,000 were paid by Minnesota Blue Cross to hospitals during the first eight months of 1956 for hospitalization of Minnesota participant subscribers. This represents an increase of 23 per cent or nearly $3,000,000 over the $12,538,567 paid to hospitals during the similar period of the preceding year. Increased incidence rate and the continuing trend of Blue Cross subscribers toward higher room allowance coverage as well as increased enrollment have contributed to these increases in Blue Cross hospitals payments.

The increased incidence for January through August, 1956, over the same period of 1955 is reflected in the increase in the number of respiratory illnesses and accident cases per 1,000 persons protected.

Blue Cross enrollment as of August, 1956, totaled 403,441 contracts representing 1,067,982 participant subscribers as compared to 382.294 contracts representing 1,012,850 participant subscribers as of August, 1955. This is an increase of 21,147 contracts representing 55,132 participant subscribers.

Minnesota Blue Shield paid physicians $4,579,938 during the first eight months of 1956 for medical-surgical-obstetrical services rendered participant subscribers. During the same period in 1955 Blue Shield paid $3,774,781 for physicians' services rendered participant subscribers. Blue Shield payments from January 1 through August of 1956, were $805,157 more than total payments during the first eight months of 1955, representing an increase of over 21 per cent.

Payments for physicians' services rendered Blue Shield subscribers reached an all-time high for a one month period in August, 1956, when Blue Shield paid $637,807 for such services. Blue Shield claims' payments in August, 1956, represent an increase of nearly 30 per cent over the amount, $490,951, paid for claims in August, 1955.

The tremendous increases in Blue Shield benefits paid during the first eight months of 1956 over the same period in 1955 and during August, 1956, over August, 1955, are attributable to increased benefits added to July 1, 1955, to greater utilization, and to increased Blue Shield enrollment.

Blue Shield enrollment as of August 31, 1956 was 786,795 participant subscribers. This figure represents an increase in enrollment of over 11 per cent above the 706,539 participant subscribers enrolled as of August 31, 1955.

Communications

Dear Editor:

Will you kindly allow space in your esteemed publication for the following:

The function of an editorial is to elucidate the subject treated. The editorial comments by Dr. George G. Stilwell on "The Present Status of the Seroflocculation Reaction" which appeared in MINNESOTA MEDICINE on September, 1956, are both confusing and misleading.

In the paper under discussion, it was emphatically stated that the seroflocculation reaction at its present stage of development could not be considered a specific test for cancer. The point stressed throughout the paper, namely, the importance of the seroflocculation reaction as a phenomenon, seemed to have escaped the attention of the commentator completely.

The criteria for a cancer test set up by Dr. Stilwell are on the level of perfection. No false positives, no false negatives, no doubtfuls, et cetera. Another item which should have been included in his "dream test" was to have a mechanism as part of it to announce the exact location of the cancerous process. Does that imply that any procedure below that level should not be utilized in cancer detection? The seroflocculation test for syphilis has been used for over twenty-five years. Does it in any way, with the probable exception of T.P.I., approach the criteria recommended by Dr. Stilwell? He states that "the only satisfactory current method for the identification of cancer is the use of biopsy and of cytologic examination of smear." Are these two procedures perfect?

As to the high incidence of false positives in the healthy population, I wish to take this opportunity to state that as a result of a recent modification of the procedure, which is to be published shortly, the number of false positives in the above category was reduced from nine per cent to about one per cent.

Respectfully yours,

H. S. PENN, M.D.

Los Angeles, California
October 12, 1956

PROVEN
PAIN CONTROL

with sedation

GRADATIONS OF ANALGESIA
with light sedation

'EMPIRAL'®

Phenobarbital	gr. ¼
Acetophenetidin	gr. 2½
Acetylsalicylic Acid	gr. 3½

'CODEMPIRAL'® No. 2(N)

Codeine Phosphate	gr. ¼
Phenobarbital	gr. ¼
Acetophenetidin	gr. 2½
Acetylsalicylic Acid	gr. 3½

'CODEMPIRAL'® No. 3(N)

Codeine Phosphate	gr. ½
Phenobarbital	gr. ¼
Acetophenetidin	gr. 2½
Acetylsalicylic Acid	gr. 3½

(N) subject to Federal Narcotic Law

BURROUGHS WELLCOME & CO. (U.S.A.) INC.
Tuckahoe, N. Y.

NEW

For Pain-Fr

of every

In “Rheumatism

M*ulti*

TEM

combine:

THE PROPER FORMULA
PROPERLY FORMULATED

Physical separation of the steroid component from the aluminum hydroxide as provided by the Multiple Compressed Tablet construction assures full potency and stability of prednisolone.

PREDNISOLONE *(1*

+

ASPIRIN *(0.3 Gm.)*........

+

ASCORBIC ACID *(50*

+

ANTACID *(0.2 Gm.)*.......

*Early rheumatoid arthritis
Rheumatoid spondylitis
Osteoarthritis
Still's disease
Psoriatic arthritis
Bursitis
Synovitis
Tenosynovitis
Myositis
Fibrositis
Neuritis

erformance

tvities

atients

mpressed Tablets

GEN®

..... for anti-inflammatory, anti-rheumatic benefits *at effective low dosage.*

...... for analgesia plus additional anti-rheumatic activity.

...... for anti-stress support that guards against adrenal ascorbic acid depletion.
(Ascorbic Acid present as 60 mg. Sodium Ascorbate.)

...... dried aluminum hydroxide gel minimizes the possibility of gastric distress.

DOSAGE: *1-4 TEMPOGEN Tablets t.i.d. or q.i.d. (TEMPOGEN Forte, 1 or 2 tablets t.i.d. or q.i.d.) for one or two weeks. Then lower by 1 tablet every four or five days to maintenance level.*

SUPPLIED: *TEMPOGEN and TEMPOGEN Forte —in bottles of 100 Multiple Compressed Tablets. (TEMPOGEN Forte provides 2 mg. of prednisolone.)*

MSD
MERCK SHARP & DOHME
DIVISION OF MERCK & CO., INC.
PHILADELPHIA 1, PA.

A more complete gall bladder regimen in a single tablet...

Colicell

Each Tite-Coat Red Tablet Contains:

Extracts of Whole Bile (Equal parts Ox and Hog)	210.0 mg.
Ketocholanic Acids (Oxidized or keto form of normally occurring bile acids containing approximately 93% dehydrocholic acid)	90.0 mg.
Methyl Cellulose	130.0 mg.
Homatropine Methylbromide	2.5 mg.

(In bottles of 100 and 1000 tablets.)

- *more effective . . . for a longer period of time*
- *specially coated to prevent gastric disturbance*
- *lower cost than most bile acid preparations that have only a single purpose*

SINCE 1883

SAMPLES AND LITERATURE ON REQUEST
SUTLIFF & CASE CO., INC.
Pharmaceutical Specialties
PEORIA, ILLINOIS

---

help protect your patients' eyes . . .

SPECIFY BENSON'S HARDRx* SAFETY LENSES

the lenses that can take it!

To meet BENSON'S rigid standards of safety, every HARDRx Safety Lens must withstand the impact of a 5/8" steel ball dropped from a height of more than 4 feet.

For the past 18 years, outstanding doctors all over the country have provided an added margin of safety for their patients by specifying HARDRx SAFETY LENSES . . . available only from BENSON laboratories.

These lenses, ground to 2mm at their thinnest point and exposed to intense heat, offer high impact resistance – without variation in the accuracy of the ℞ and without change in appearance.

Join the growing number of doctors who specify BENSON'S HARDRx SAFETY LENSES. Try HARDRx service today – it receives the same prompt handling as BENSON'S regular ℞ service.

* *Pronounced "HARD-REX." For Industrial use, specify* BENSON'S BENSAFE *Lenses.*

For complete information, send the coupon today . . .

BENSON OPTICAL CO., Minneapolis 2, Minn. Dept. MM116
Please send me information on BENSON'S Safety Lenses.

Name________________________

Address________________________

City______________Zone____State______

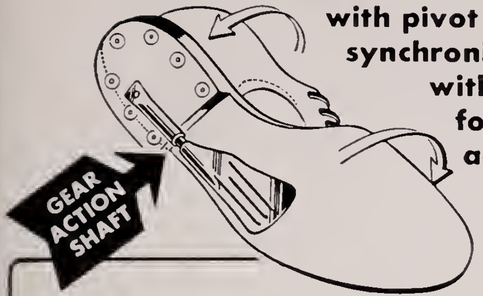
Since 1913

Benson
OPTICAL COMPANY

Executive Offices
Minneapolis 2, Minn.

COMPLETE LABORATORIES CONVENIENTLY LOCATED IN UPPER MIDWEST CITIES

The Gear Action Shoe★ with pivot arch synchronizing with the foot in action



- Insole extension and wedge at inner corner of heel where support is most needed.
- The patented arch support construction is guaranteed not to break down.
- Innersoles guaranteed not to crack or collapse.
- Foot-so-Port lasts designed and the shoe construction engineered with orthopedic advice.
- Conductive Shoes for surgical and operating room personnel. N.B.F.U. specifications.

★We are also the manufacturer of the Gear-Action Shoe designed by noted orthopedic surgeon.

- We make more shoes for polio, club feet and disabled feet than any other shoe manufacturer.

Send for free booklet, "The Preservation of the Function of the Foot Balancing and Synchronizing the Shoe with the Foot."

Write for details or contact your local **FOOT-SO-PORT** *Shoe Agency. Refer to your Classified Directory*

Foot-so-Port Shoe Company, Oconomowoc, Wis.
A Division of Musebeck Shoe Company

"The mercurial diuretics have the justified reputation of being the most powerful and consistently effective of all diuretic drugs."*

TABLET
NEOHYDRIN®

*Goodman, L. S., and Gilman, A.: The Pharmacological Basis of Therapeutics, ed. 2, New York, The Macmillan Company, 1955, p. 847.

07756

EVERY WOMAN

WHO SUFFERS

IN THE

MENOPAUSE

DESERVES

"PREMARIN,"

widely used

natural, oral

estrogen

AYERST LABORATORIES
New York, N.Y. • Montreal, Canada
5645

Brown & Day, Inc.

Artificial heat of this season brings the need for added

HEALTHFUL PROTECTIVE MOISTURE

for you and your patients

WALTON HUMIDIFIERS use a centrifugal operating principle, which keeps the evaporation rate positive, and assures sufficient moisture at all times.

Handsome custom models enhance appearance; eliminate need for heating coils, fans, filter packs, and other out-of-date methods.

LET US SEND YOU A DESCRIPTIVE FOLDER

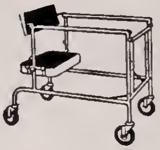
"Everything for the Physician"

for fast service call

CA 2-1845

SERVICE BROWN & DAY INC SAINT PAUL USA QUALITY

62-64 EAST 5TH ST
St. Paul 1, Minn.



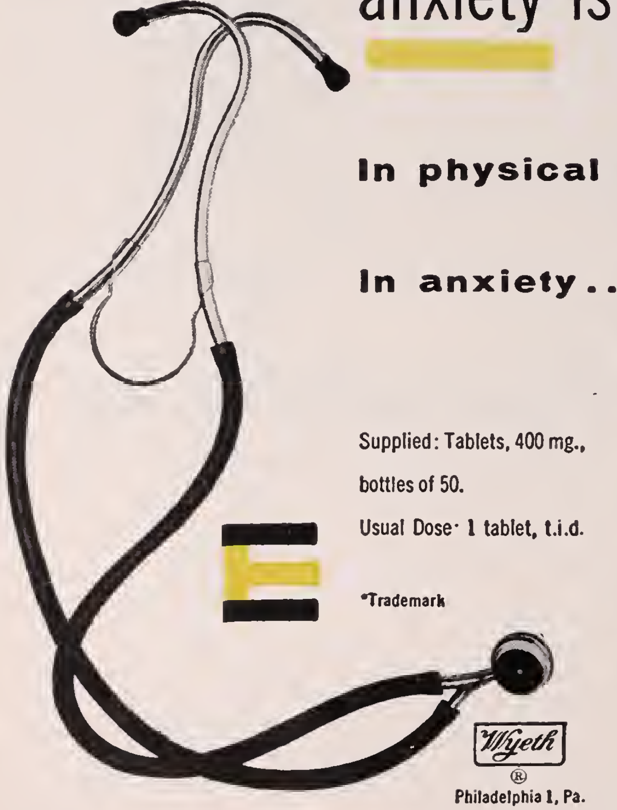
DOCTOR!

Prescribe the Hollywood Adjustable Walker.

FULLY ADJUSTABLE for size
EVEREST & JENNINGS quality construction for long trouble-free service.

LOW IN PRICE, $82.00, with crutch supports.

C. F. Anderson & Co., Inc.
Equipment of Recognized Merit
901 Marquette Avenue
Minneapolis, Minn.
FE. 3-6508



anxiety is part of every illness

In physical sickness... anxiety

In anxiety...

Supplied: Tablets, 400 mg., bottles of 50.
Usual Dose· 1 tablet, t.i.d.

*Trademark

Equanil*

MEPROBAMATE
(2-methyl-2-*n*-propyl-1,3-propanediol dicarbamate)
Licensed under U.S.Patent No. 2,724,720

Wyeth®
Philadelphia 1, Pa.

anti-anxiety factor with muscle-relaxing action

Upjohn

Rheumatoid arthritis, rheumatic fever, intractable asthma, allergies . . .

Cortef* *tablets*

Supplied:

5 mg. tablets in bottles of 50
10 mg. tablets in bottles of 25, 100, 500
20 mg. tablets in bottles of 25, 100, 500

*REGISTERED TRADEMARK FOR THE UPJOHN BRAND OF HYDROCORTISONE (COMPOUND F)

The Upjohn Company, Kalamazoo, Michigan

25 Compressed Tablets
Cortef®, 20 mg.
Brand of hydrocortisone
The Upjohn Company
Kalamazoo, Michigan

APH
OMAHA
APC
OMAHA

the Emblems of RELIABLE PROTECTION

We cordially invite your inquiry
for application for membership
which affords protection against
loss of income from accident and
sickness as well as benefits for
hospital expenses for you and
all your dependents.

ALL **PREMIUMS** COME FROM **PHYSICIANS SURGEONS DENTISTS** ALL **BENEFITS** GO TO

$4,500,000 ASSETS
$23,800,000 PAID FOR BENEFITS
SINCE ORGANIZATION

Since 1902

PHYSICIANS CASUALTY
AND
HEALTH ASSOCIATIONS
OMAHA 2, NEBRASKA

"Patients without primary renal disease, but with albuminuria and high nonprotein nitrogen due to congestive circulatory changes, can be adequately and safely treated with Neohydrin for long periods of time."*

*Griffith, G. C.; Dimitroff, S. P., and Thorner, M. C.: Ann. Int. Med. 45:7, 1956.

07656

Cook County Graduate School of Medicine

INTENSIVE POSTGRADUATE COURSES
STARTING DATES—WINTER, 1956-1957

SURGERY—Surgical Technic, two weeks, November 26, December 10
- Surgery of Colon and Rectum, one week, November 26, March 4
- General Surgery, one week, February 11
- General Surgery, two weeks, April 23
- Surgical Anatomy and Clinical Surgery, two weeks, March 4
- Basic Principles in General Surgery, two weeks, January 14
- Fractures and Traumatic Surgery, two weeks, November 26

GYNECOLOGY AND OBSTETRICS
- Office and Operative Gynecology, two weeks, February 11
- Vaginal Approach to Pelvic Surgery, one week, February 4
- General and Surgical Obstetrics, two weeks, February 25

MEDICINE—Electrocardiography and Heart Disease, two-week basic course, March 11
- Gastroenterology, two weeks, May 13
- Dermatology, two weeks, May 6
- Gastroscopy, two weeks, March 18

RADIOLOGY—Diagnostic X-ray, two weeks, November 26
- Clinical Uses of Radioisotopes, two weeks, May 6

UROLOGY—Two-week, course April 1
- Cystoscopy, ten days, by appointment

TEACHING FACULTY—ATTENDING
STAFF OF COOK COUNTY HOSPITAL

ADDRESS: REGISTRAR, 707 South Wood Street,
Chicago 12, Illinois

For preventing
and treating
upper respiratory
infections

Achrocidin*

Tetracycline-Antihistamine-Analgesic Compound

Available on prescription only

ACHROMYCIN® Tetracycline	125 mg.
Phenacetin	120 mg.
Caffeine	30 mg.
Salicylamide	150 mg.
Chlorothen Citrate	25 mg.

Bottle of 24 tablets.

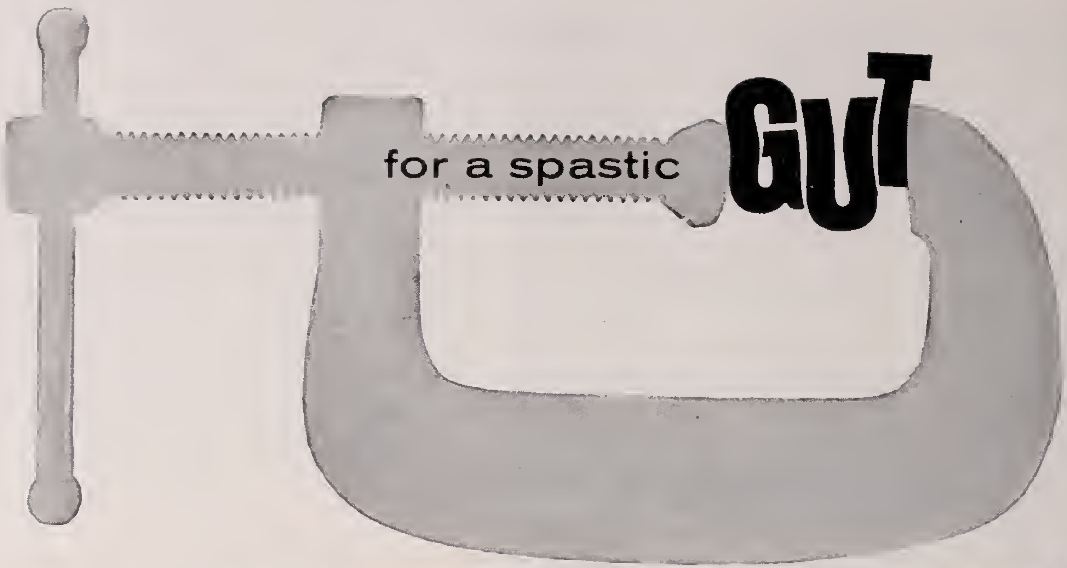
ACHROCIDIN is a well-balanced, comprehensive formula directly modifying the complications of the common cold or upper respiratory infections.

In addition to the direct benefit of rapid symptomatic improvement, ACHROCIDIN promptly controls the bacterial component frequently responsible for the development in susceptible individuals of sequelae such as otitis media, sinusitis, adenitis, and bronchitis.

ACHROCIDIN is convenient for you to prescribe—easy for the patient to take. Average adult dose: two tablets three or four times daily.

LEDERLE LABORATORIES DIVISION, AMERICAN CYANAMID COMPANY, PEARL RIVER, NEW YORK Lederle

*TRADEMARK



Trasentine®-Phenobarbital

C I B A
Summit, N. J.

integrated relief . . .
mild sedation
visceral spasmolysis
mucosal analgesia

TABLETS *(yellow, coated), each containing 50 mg. Trasentine® hydrochloride (adiphenine hydrochloride CIBA) and 20 mg. phenobarbital.*

2/2228M

Malpractice Prophylaxis

With us
a doctor's involvement
in malpractice charges
are as confidential
as his own relations with his
patient

Specialized Service
makes our doctor safer

THE
MEDICAL PROTECTIVE COMPANY
FORT WAYNE, INDIANA

Professional Protection Exclusively
since 1899

MINNEAPOLIS Office:
Robert L. McFerran, Rep.
311 East 24th St., Apt. A-1
Telephone Federal 9-1292

ORTHOPEDIC APPLIANCES

For years we have maintained the highest standards of quality, expert workmanship and exacting conformity to professional specifications . . . a service appreciated by physicians and their patients.

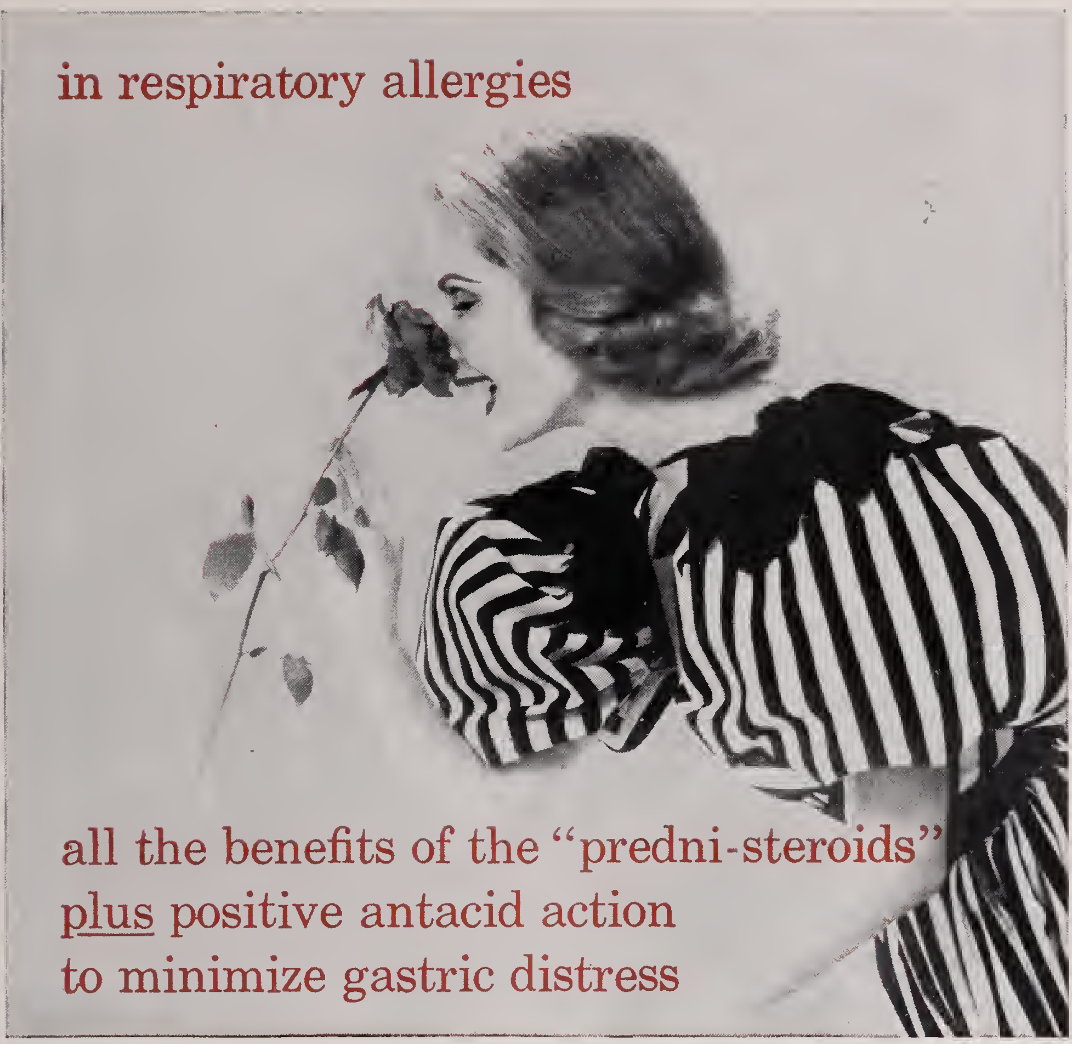
ARTIFICIAL LIMBS, TRUSSES
SUPPORTERS, ELASTIC HOSIERY
Prompt, painstaking service

Buchstein-Medcalf Co.
223 So. 6th St. Minneapolis 2, Minn.

GYNECOLOGIC CYTOLOGY SERVICE

Interpretation of Cervico-Vaginal, Etc.
(Papanicolaou) Smears
for the
Diagnosis of Carcinoma
Kits (Slides, Spatulas, Fixative and
Mailing Containers)
and
Instructions for Taking and Mailing
Smears furnished on request

M. WM. RUBENSTEIN, M.D.
GYNE-CYTOLOGY LABORATORY
636 Church Street, Room 517 Evanston, Illinois


in respiratory allergies
all the benefits of the "predni-steroids"
plus positive antacid action
to minimize gastric distress

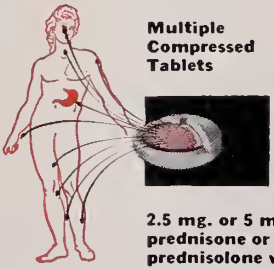
ROUTINELY ACHIEVED WITH **'Co-Deltra'**

(Prednisone Buffered)

**Multiple
Compressed
Tablets**

'Co-Hydeltra'

(Prednisolone Buffered)



Clinical evidence[1,2,3] indicates that to augment the therapeutic advantages of prednisone and prednisolone, antacids should be *routinely* co-administered to minimize gastric distress.

References: 1. Boland, E. W., *J.A.M.A.* 160:613 (February 25) 1956. 2. Margolis, H. M. *et al., J.A.M.A.* 158:454 (June 11) 1955. 3. Bollet, A. J. *et al., J.A.M.A.* 158:459 (June 11) 1955.

2.5 mg. or 5 mg. prednisone or prednisolone with 50 mg. magnesium trisilicate and 300 mg. aluminum hydroxide gel.

MSD
MERCK SHARP & DOHME
DIVISION OF MERCK & CO., INC
PHILADELPHIA 1, PA.

'CO-DELTRA' *and* 'CO-HYDELTRA' *are trademarks of* MERCK & CO., INC.

Classified Advertising

Replies to advertisements with key numbers should be mailed in care of Minnesota Medicine *2642 University Avenue, Saint Paul 14, Minnesota.*

PHYSICIAN NEEDED—In county seat town of 1800, located in excellent farming community, Central Minnesota. No other physician within 35-mile radius. New 25-bed hospital planned. Good schools and housing. Office available. Address Kenneth Mattson, Mahnomen, Minnesota.

WANTED—Physician for locum tenens three weeks, from December 15 through January 4, in town of 1200 people with large surrounding rural area. Only practitioner in town. Within twenty-two miles of hospital on good highway. Address E-555, care Minnesota Medicine.

LARGE NATIONALLY KNOWN INDUSTRIAL CONCERN has opening for general practitioner, recent medical graduate, or one desiring to enter the industrial field. Complete modern Medical Department, no Saturday or Sunday work, paid holidays, vacations, sick leave and pension plan. Fine opportunity for right man in town of 18,000, near Twin Cities. Address E-556, care Minnesota Medicine.

GLYCAMINE®
TABLETS

For Peptic Ulcers and Hyperacidity

Available All Drug Stores

Distributed by
DALCO PHARMACAL CO.
Minneapolis, Minnesota

THE BANK WHERE YOU FEEL AT HOME

the AMERICAN
NATIONAL BANK OF SAINT PAUL
MEMBER FEDERAL DEPOSIT INSURANCE CORPORATION

WANTED—Christian doctor with surgical training and experience to associate with doctor in general practice in town of approximately 1,500 population and large rural territory; new up-to-date hospital. Write E-547, care Minnesota Medicine.

UNUSUAL OPPORTUNITY for young physician to join two-man group in southwestern Minnesota. Excellent starting salary; partnership after first year. New well-equipped, 22-bed hospital with offices in hospital. Adequate time off and time for postgraduate study. Excellent hunting and fishing. Training or interest in Pediatrics desirable, but not necessary. Address E-554, care Minnesota Medicine.

FOR RENT—Suite of seven rooms, especially designed for physician's use located at 2723 East 38th Street, Minneapolis. Occupied by M.D. past eleven years. Write or call H. A. Lindberg, 3925 28th Avenue South, Minneapolis 6, PArkway 2-0002.

FOR RENT—Highland Shopping Area, partially equipped office available, full or part time. Excellent for general practice, obstetrics, pediatrics. No rent until established. Address H. Schwyzer, M.D., 530 Lowry Medical Arts Building, Saint Paul 2, Minnesota. Telephone: CA 4-7416.

FOR RENT OR SALE—Eight-room, first-floor physician's office. Well equipped. Near Twin Cities. Gross over $30,000. New hospital—unlimited privileges. Good opportunity. Write E-511, care Minnesota Medicine.

FOR SALE OR LEASE—General practice in small southern Minnesota community. Address E-557, care Minnesota Medicine.

FOR SALE—Miscellaneous medical equipment, including 60 ma. Picker x-ray with new tube; Beck-Lee electrocardiograph in good condition (not direct writer); new Aloe diathermy. Also house-office combination with busy practice in lovely scenic area with all-weather paved roads near St. Cloud. Address E-553, care Minnesota Medicine.

RADIUM RENTAL SERVICE
4340 CEDARWOOD ROAD
MINNEAPOLIS 5, MINNESOTA
TEL. FE 3-5297

Radium element prepared in type of applicator requested

ORDER BY TELEPHONE OR MAIL
PRICES ON REQUEST

The Birches Sanitarium, Inc.

2391 Woodland Avenue
Duluth 3, Minnesota

A hospital for the care and treatment of Nervous and Mental disorders. Quiet, cheerful environment. Specially trained personnel. Recreational and occupational therapy.

Dr. L. R. Gowan, M.D., M.S., Medical Director

Index to Advertisers

Abbott Laboratories A-20, A-21
Aloe, A. S., Co. 722-D
American Meat Institute A-18
American National Bank of St. Paul A-56
Anderson, C. F., Co., Inc. A-50
Ayerst Laboratories A-49

Baker Laboratories, Inc. A-8
Bayer Company Division A-16
Benson Optical Co. A-48
Birches Sanitarium A-57
Brown & Day, Inc. A-50
Buchstein-Medcalf Co. A-54
Burroughs Wellcome & Co., Inc. A-34, A-44, A-45

Caswell-Ross Agency 722-A
Chicago Medical Society A-58
Ciba A-54
Classified Advertising A-56
Cook County Graduate School of Medicine A-52
Corn Products Refining Co. A-22

Dalco Pharmacal Co. A-56
Danielson Medical Arts Pharmacy, Inc. A-57
Druggists Mutual Insurance Co. A-57

Foot-so-Port Shoe Co. A-49

Geigy Pharmaceuticals A-6
Gyne-Cytology Laboratory A-54

Hoffmann-La Roche, Inc. .... Insert facing A-16

Knox Gelatine Co. A-7

Lakeside Laboratories A-33, A-49, A-52

Lederle Laboratories A-5, 722-B, 722-C, A-53
Lilly, Eli, & Co. .... Cover I, A-38

Medical Protective Co. A-54
Merck Sharp & Dohme A-10, A-11, A-30, A-31, A-35, A-46, A-47, A-55

New Orleans Graduate Medical Assembly .... Cover III

Parke, Davis & Co. .... Cover II, A-1
Pfizer Laboratories, Div. Chas. Pfizer & Co., Inc. A-12, A-13, A-23, A-24, A-25, A-26
Physicians Casualty & Health Associations A-52
Physicians & Hospitals Supply Co. A-42, A-43
Professional Credit Protective Bureau A-28

Radium Rental Service A-56
Robins, A. H., Co., Inc. .... Insert facing A-32

St. Croixdale Sanitarium A-58
St. Paul Fire & Marine Insurance Co. 722-D
Searle, G. D., & Co. A-39
Schering Corporation A-14, A-15, A-36, A-37
Smith, Kline & French Laboratories .... Cover IV
Squibb A-4
Sutliff & Case Co., Inc. A-48

Upjohn A-51
U. S. Vitamin Corporation A-27

Viceroy Cigarettes A-32

Wallace Laboratories A-9
Winthrop Laboratories .... A-19, Cover III
Wyeth, Inc. A-17, A-29, A-50

Year Book Publishers, Inc. A-41

DANIELSON MEDICAL ARTS PHARMACY, INC.

PHONES:
FEderal 3-3317
FEderal 3-3318

10-14 Arcade, Medical Arts Building
825 Nicollet Avenue—Two Entrances—78 South Ninth Street
MINNEAPOLIS

HOURS:
WEEK DAYS—8 to 7
SUN. & HOL.—10 to 1

Insurance at a Saving

Druggists' Mutual Insurance Company
OF IOWA, ALGONA, IOWA

Fire - Tornado - Automobile Insurance

Prompt Loss Service

MINNESOTA REPRESENTATIVE—S. E. STRUBLE, WYOMING, MINN.

Annual Clinical Conference

CHICAGO MEDICAL SOCIETY

March 5, 6, 7 and 8, 1957

Palmer House • Chicago

Daily Half-Hour Lectures by Outstanding Teachers and Speakers on subjects of interest to both general practitioner and specialist

Panels on Timely Topics Daily Teaching Demonstrations

Medical Color Telecasts

Scientific Exhibits worthy of real study and helpful and time-saving Technical Exhibits

The Chicago Medical Society Annual Clinical Conference should be a MUST on the calendar of every physican. Plan now to attend and make your reservation at the Palmer House.

A MODERN PRIVATE SANITARIUM

for the Diagnosis, Care and Treatment of Nervous and Mental Disorders

MAIN BUILDING—One of 10 Units in "Cottage Plan"

ST. CROIXDALE ON LAKE ST. CROIX

PRESCOTT, WISCONSIN

Located on beautiful Lake St. Croix, 18 miles from the Twin Cities, it has the advantages of both City and Country. Every facility for treatment provided, including recreational activities and occupational-therapy under trained personnel. Close personal supervision given patients, and modern methods of therapy employed. Inspection and cooperation by reputable physicians invited. Rates very reasonable. Illustrated folder on request.

Prescott Office
Prescott, Wisconsin
Howard J. Laney, M.D.
Tel. 39 and Res., 76

Consulting Neuro-Psychiatrists
Hewitt B. Hannah, M.D., Andrew J. Leemhuis, M.D.
527 Medical Arts Bldg., Tel. FE. 2-1357, Minneapolis, Minn.

Superintendent
Ella M. Leseman
Prescott, Wisconsin
Tel. 69

ANNOUNCING
The Twentieth Annual Meeting
of
THE NEW ORLEANS GRADUATE
MEDICAL ASSEMBLY
Conference Headquarters—Municipal Auditorium
March 11, 12, 13, 14, 1957

GUEST SPEAKERS

Emery A. Rovenstein, M.D., New York, N. Y.
Anesthesiology
Nelson Paul Anderson, M.D., Los Angeles, Calif.
Dermatology
J. Edward Berk, M.D., Detroit, Mich.
Gastroenterology
Erle Henriksen, M.D., Los Angeles, Calif.
Gynecology
Ovid O. Meyer, M.D., Madison, Wis.
Internal Medicine
Irvine H. Page, M.D., Cleveland, Ohio
Internal Medicine
Barnes Woodhall, M.D., Durham, N. C.
Neurosurgery
John E. Savage, M.D., Baltimore, Md.
Obstetrics
C. Dwight Townes, M.D., Louisville, Ky.
Ophthalmology
Don King, M.D., San Francisco, Calif.
Orthopedic Surgery
Glassell S. Fitz-Hugh, M.D., Charlottesville, Va.
Otolaryngology
Malcolm B. Dockerty, M.D., Rochester, Minn.
Pathology
Sydney S. Gellis, M.D., Boston, Mass.
Pediatrics
Karl Zimmerman, M.D., Pittsburgh, Penna.
Proctology
Laurence L. Robbins, M.D., Boston, Mass.
Radiology
Danely P. Slaughter, M.D., Chicago, Ill.
Surgery
C. Stuart Welch, M.D., Albany, N. Y.
Surgery
William L. Valk, M.D., Kansas City, Kans.
Urology

Lectures, symposia, clinicopathologic conferences, round-table luncheons, medical motion pictures, scientific exhibits and technical exhibits.

(All-inclusive registration fee—$20.00)

THE POSTCLINICAL TOUR TO THE MEDITERRANEAN AND EUROPE
Leaving March 16, 1957, from New York

For information concerning the Assembly meeting and the tour write Secretary, Room 103, 1430 Tulane Avenue, New Orleans 12, La.

MONODRAL® WITH MEBARAL®

psychovisceral
stabilizer

ANTICHOLINERGIC • SEDATIVE

in peptic ulcer management

- relieves pain promptly
- reduces tension safely
- tranquilizes without dulling
- well tolerated
- promotes healing
- maintains anacidity for hours
- controls hyperactivity of upper gastro-intestinal tract

Monodral with Mebaral—the "psychovisceral stabilizer"—provides for patients with ulcer and gastro-intestinal spasm an effective barrier against the impact of environmental stimuli . . . controls gastric hypersecretion and hypermotility for three and one half to five hours.*

EACH TABLET CONTAINS:
Monodral bromide..... 5 mg.
Mebaral..............32 mg.

DOSAGE: 1 or 2 tablets three or four times daily.
Available on prescription only.
Bottles of 100 tablets.

Winthrop Laboratories New York 18, N. Y.

Monodral (brand of penthienate) and Mebaral (brand of mephobarbital), trademarks reg. U. S. Pat. Off.
**References and clinical trial supplies available on request.*

'Thorazine' relieved this patient's anxiety, tension and fear and made it possible for him to return to work.

'THORAZINE' CASE REPORT

patient: Anxiety, tension, and a fear of going out alone made it impossible for this 36-year-old man to work. After other treatments had failed he was given 'Thorazine'.

response: "On 'Thorazine' medication, 100 mg. orally, daily, his anxiety and apprehension disappeared rapidly. The patient was able to go out alone and to work once again. His mood was actually gay and his co-workers were surprised at this change. He was now free from care whereas before he had been distressed by the slightest difficulty."

This case report is from the files of a general practitioner.

THORAZINE*

Available in ampuls, tablets and syrup (as the hydrochloride), and in suppositories (as the base).

Smith, Kline & French Laboratories, Philadelphia

'Thorazine' should be administered discriminately and, before prescribing, the physician should be fully conversant with the available literature.

*T.M. Reg. U.S. Pat. Off. for chlorpromazine, S.K.F.

Minnesota MEDICINE

COLLEGE OF PHYSICIANS
LIBRARY
MAR - 6 1957
OF PHILADELPHIA

PUBLISHED MONTHLY BY THE MINNESOTA STATE MEDICAL ASSOCIATION

Volume 39 DECEMBER, 1956 Number 12

Printed in U.S.A. (Table of Contents—Pages A-2 and A-3) 40c a copy—$3.00 a year

Infections of the respiratory tract respond readily to

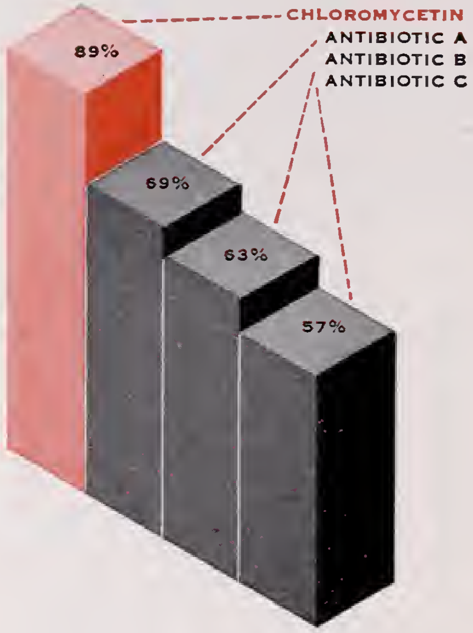
ILOTYCIN
(ERYTHROMYCIN, LILLY)

safe, well tolerated

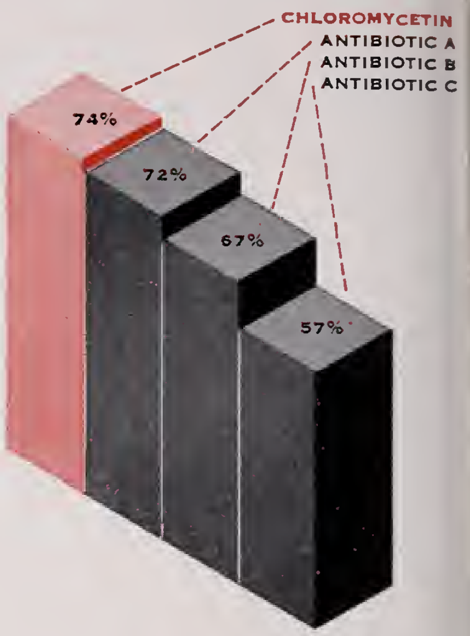
Lilly
QUALITY / RESEARCH / INTEGRITY

632101

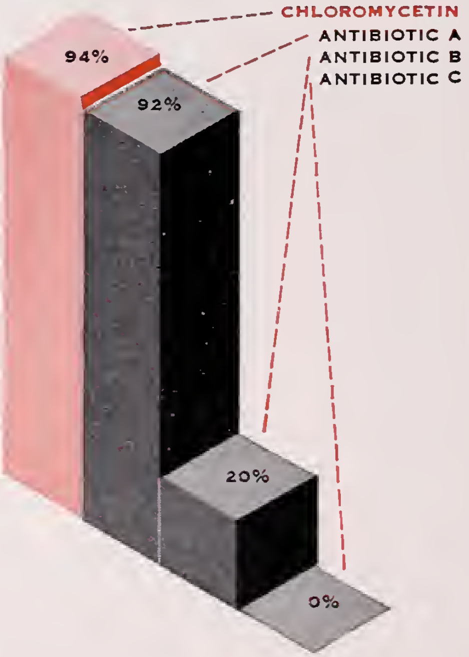
SENSITIVITY OF COMMON PATHOGENS TO CHLOROMYCETIN AND THREE OTHER MAJOR ANTIBIOTIC AGE



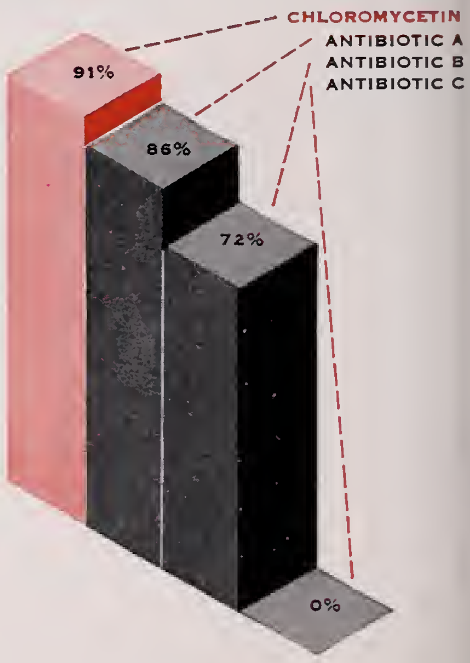
NONHEMOLYTIC MICROCOCCUS AUREUS
(363-418 STRAINS)



HEMOLYTIC MICROCOCCUS AUREUS
(729-776 STRAINS)



ESCHERICHIA COLI
(478-586 STRAINS)



AEROBACTER AEROGENES
(153-193 STRAINS)

greater antibacterial efficacy...

Chloromycetin®

for today's problem pathogens

Because of the increasing emergence of pathogenic strains resistant to commonly used antibiotics, judicious selection of the most effective agent is essential to successful therapy. *In vitro* sensitivity studies serve as a valuable guide to the antibiotic most likely to be most effective. Both clinical experience and sensitivity studies indicate the greater antibacterial efficacy of CHLOROMYCETIN (chloramphenicol, Parke-Davis) treatment for many resistant infections.[1-7]

CHLOROMYCETIN is a potent therapeutic agent and, because certain blood dyscrasias have been associated with its administration, it should not be used indiscriminately or for minor infections. Furthermore, as with certain other drugs, adequate blood studies should be made when the patient requires prolonged or intermittent therapy.

References (1) Altemeier, W. A.; Culbertson, W. R.; Sherman, R.; Cole, W.; Elstun, W., & Fultz, C. T.: *J.A.M.A.* 157:305 (Jan. 22) 1955. (2) Austrian, R.: *New York J. Med.* 55:2475 (Sept. 1) 1955. (3) Murphy, F. D., & Waisbren, B. A., *in* Murphy, F. D.: Medical Emergencies: Diagnosis and Treatment, ed. 5, Philadelphia, F. A. Davis Company, 1955, p. 557. (4) Weil, A. J., & Stempel, B.: *Antibiotic Med.* 1:319, 1955. (5) Jones, C. P.; Carter, B.; Thomas, W. L., & Creadick, R. N.: *Obst. & Gynec.* 5:365, 1955. (6) Kass, E. H.: *Am. J. Med.* 18:764, 1955. (7) Tebrock, H. E., & Young, W. N.: *New York J. Med.* 55:1159 (Apr. 15) 1955.

s graph is adapted
n Altemeier, Cul-
son, Sherman, Cole,
un, & Fultz.[1]

MEDICAMENTA VERA

PARKE, DAVIS & COMPANY

DETROIT, MICHIGAN

Minneapolis Academy
of Medicine Number

Minnesota

Contents for

SCIENTIFIC ARTICLES

ORIGINAL CONTRIBUTIONS

The Various Mechanisms of Suffocation in Poliomyelitis
Benjamin J. Bofenkamp, M.D., Minneapolis, Minnesota 761

A Reconsideration of Liver Function Tests
Mark C. L. Hanson, M.D., Minneapolis, Minnesota.... 764

Communicability of Infectious Hepatitis
Albert J. Greenberg, M.D., Minneapolis, Minnesota.... 768

Pre-employment Roentgenograms of the Lower Dorsal and Lumbosacral Spine in Young Men
Rolf M. Iverson, M.D., Minneapolis, Minnesota.......... 771

Fat Embolism
Lowell W. Weber, M.D., Minneapolis, Minnesota........ 775

The Return of Mastoid Surgery
Graham G. Smith, M.D., Minneapolis, Minnesota...... 778

The Eye in Diabetes Mellitus
John P. Wendland, M.D., Minneapolis, Minnesota...... 781

Carcinoma of the Laryngopharynx
Harold S. Ulvestad, M.D., Minneapolis, Minnesota.... 785

Treatment of Atrioventricular Block
A. Cabot Wohlrabe, M.D., Minneapolis, Minnesota.... 787

CASE PRESENTATIONS

Acute Recurrent Pancreatitis
Maynard C. Nelson, M.D., Minneapolis, Minnesota.. 789

Extrathyroidal Hypermetabolism Due to a Pheochromocytoma
Donald A. Scholz, M.D., *Llewelyn P. Howell, M.D.*, and *Grace M. Roth, Ph.D.*, Rochester, Minnesota 79

Traumatic Diaphragmatic Hernia with Strangulation and Gangrene of the Stomach
Daniel J. Moos, M.D., Minneapolis, Minnesota......... 79

SEMINAR

Metabolism of Melanin Pigment
Robert J. McCollister, M.D., Minneapolis, Minnesota 80

CONTINUATION STUDIES

Anesthesia for Emergency Surgery
J. R. Gordon, M.D., *D. S. P. Weatherhead, M.D.*, and *F. H. Van Bergen, M.D.*, Minneapolis, Minnesota 80

PULMONARY STUDIES

Bronchography in Chest Diseases
S. H. Tsai, M.D., Oak Terrace, Minnesota............. 81

TUMOR CONFERENCE

Case Study J. J. (St. Barnabas Hospital) and Case Study A. F. (Mount Sinai Hospital) 813

Official Journal of

Duluth Surgical Society
Minneapolis Academy of Medicine
Minneapolis Obstetrical and Gynecological Society
Minneapolis Surgical Society
Minnesota Academy of Medicine
Minnesota Obstetric and Gynecologic Society

Owner and Publisher

Published by MINNESOTA STATE MEDICAL ASSOCIATION
496 Lowry Medical Arts Building
St. Paul 2, Minnesota

Editing and Publishing Committee

E. M. Hammes, M.D.
Chairman, Saint Paul

F. M. Owens, Jr., M.D.
Saint Paul

T. A. Peppard, M.D.
Minneapolis

Henry Ulrich, M.D.
Minneapolis

Business Manager

R. R. Rosell
496 Lowry Medical Arts Building
St. Paul 2, Minnesota

THE MINNEAPOLIS ACADEMY OF MEDICINE

On January 17, 1920, ten young physicians met at Dayton's Tea Room and organized the Clinical Club of Minneapolis. The purpose of the club, as stated in the minutes of that meeting, was "To promote good fellowship and afford an opportunity for the presentation of the results of professional labors and studies in order that all might profit thereby." Eleven physicians were designated as charter members. Stanley R. Maxeiner was elected President, Clifton A. Boreen, Vice President, and Floyd O. Woodward, Secretary-Treasurer.

This organization has gradually developed into a medical forum for interchange of information. The membership now represents anesthesiology, dermatology, internal medicine, neurological surgery, ophthalmology, otolaryngology, obstetrics and gynecology, orthopedic surgery, pathology, pediatrics, proctology, psychiatry and neurology, radiology, surgery and urology. Papers presented at the eight regular monthly meetings thus reflect a wide fund of knowledge and provide a valuable opportunity for men of the various disciplines to broaden their information and interests.

The name was changed to the Minneapolis Academy of Medicine in March, 1941. In 1945, the requirements for active membership candidates were changed to include American Board certification and publication of at least one scientific paper in their specialty. The candidates are further required to prepare and present an original scientific paper to the Academy before election.

This issue of Minnesota Medicine is devoted to publication of recent papers presented before the Minneapolis Academy of Medicine. Most of these are inaugural papers and well represent the scientific aspect of the Academy's pleasant social scientific dinner meetings.

Medicine

Volume 39
Number 12

December, 1956

MISCELLANEOUS ARTICLES

DITORIALS

The Degenerative Complications of Diabetes 815
The Need for Hospitals and Related Facilities in Minnesota 815
The Pre-Medical Student and the Medical School 816
When Does the Physician Need an Architect? 817
The Minnesota Human Genetics League 817
Telephone "Gadgets" 818
Rehabilitation in Pulmonary Tuberculosis 819
The Registry of Medical Technologists 820
Photoengraving—Color Process 821

RESIDENT'S LETTER

Swan Song 822

EDICAL ECONOMICS

Dependent Medical Care Program Goes Into Effect 823
Passage of H.R. 7225 Makes More Government Funds Available for Medical Care 823
Election Results Affect Health Bills 823
Doctor Draft to End July 1 824
North Central Conference Reviews Medical Economic Problems 824
LETTER TO THE EDITOR 827
MINNESOTA STATE BOARD OF MEDICAL EXAMINERS 828
MEETINGS AND ANNOUNCEMENTS 829
WOMAN'S AUXILIARY 830
IN MEMORIAM 832
GENERAL INTEREST 833
INDEX TO VOLUME 39 837

Minnesota Society of Clinical Pathologists
Minnesota Society of Internal Medicine
Minnesota Society of Neurology and Psychiatry
Minnesota State Medical Association
Minnesota Surgical Society
Northern Minnesota Medical Association
Saint Paul Surgical Society
Southern Minnesota Medical Association

GENERAL INFORMATION

Readers and Reviewers

The right is reserved to reject material submitted for reading or advertising columns. The views expressed in this journal do not necessarily represent those of the Minnesota State Medical Association or any of its constituents.

Advertisers and Subscribers

Classified advertising—10 cents a word; minimum charge $2.00; key number, 25c additional. Remittance should accompany order. Display advertising rates on request.

Annual Subscription—$3.00. Single Copies—$0.40. Foreign and Canadian—$3.50.

Communications concerning advertising and subscriptions should be addressed to Minnesota Medicine, 2642 University Avenue, Saint Paul 14, Minnesota. Telephone Midway 6-2641.

Copyright and Post Office Entry

Contents of Minnesota Medicine ©1956 by Minnesota State Medical Association.

Entered at the Post Office in Saint Paul as second class matter. Accepted for mailing at the special rate of postage provided for in Section 1103, Act of October 3, 1917, authorized July 13, 1918.

Board of Editors

Arthur H. Wells, M.D.
Editor-in-Chief, Duluth

Stuart W. Arhelger, M.D.
Minneapolis

John F. Briggs, M.D.
Saint Paul

S. Francis Ceplecha, M.D.
Redwood Falls

Tague C. Chisholm, M.D.
Minneapolis

Robert B. Howard, M.D.
Minneapolis

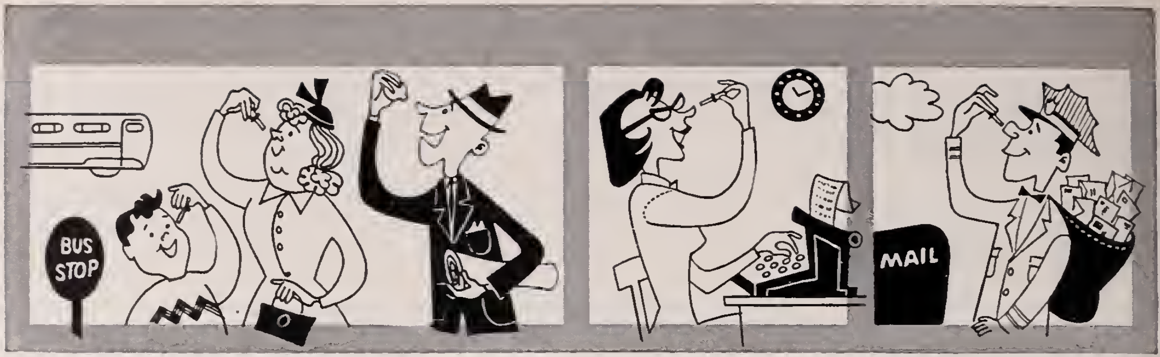
R. Drew Miller, M.D.
Rochester

Henry G. Moehring, M.D.
Duluth

Glenn J. Mouritsen, M.D.
Fergus Falls

Olive V. Seibert, B.A.
Saint Paul

George Stilwell, M.D
Rochester



In Colds... *Anywhere... Any time...*

Neo-Synephrine®

hydrochloride

Prompt and Prolonged Decongestion
Sinus Drainage and Aeration

NO IRRITATION • NO SEDATION • NO EXCITATION

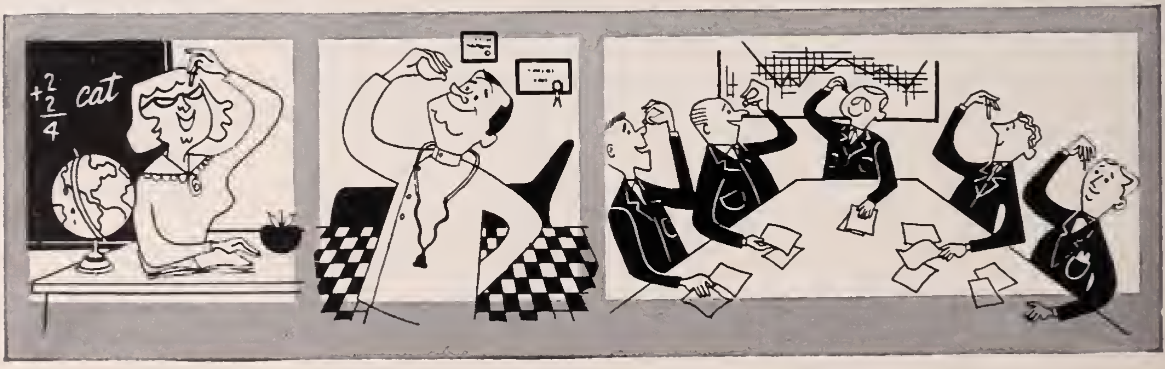
- ✱ **Nasal Solutions** 0.25%, 0.5% and 1%
- ✱ **Nasal Spray** 0.5%
- ✱ **Pediatric Nasal Spray** 0.25%,

} *plastic, unbreakable squeeze bottle leakproof, delivers a fine mist*

with Zephiran® chloride 1:5000,
antibacterial wetting agent and preservative
for greater efficiency

Neo-Synephrine (brand of phenylephrine)
and Zephiran (brand of benzalkonium,
as chloride, refined),
trademarks reg. U.S. Pat. Off.

Winthrop LABORATORIES
NEW YORK 18, N. Y. • WINDSOR, ONT.



relaxes
both mind
and
muscle

*for the average
patient in
everyday practice*

- well suited for prolonged therapy
- well tolerated, nonaddictive, essentially nontoxic
- no blood dyscrasias, liver toxicity, Parkinson-like syndrome or nasal stuffiness
- chemically unrelated to chlorpromazine or reserpine
- does not produce significant depression
- orally effective within 30 minutes for a period of 6 hours

Indications: **anxiety and tension states, muscle spasm.**

THE ORIGINAL MEPROBAMATE
Miltown®
Tranquilizer with muscle-relaxant action

DISCOVERED AND INTRODUCED
BY WALLACE LABORATORIES, *New Brunswick, N.J.*

2-methyl-2-n-propyl-1,3-propanediol dicarbamate—U.S. Patent 2,724,720
SUPPLIED: *400 mg. scored tablets. Usual dose: 1 or 2 tablets t.i.d.*
Literature and Samples Available on Request

THE MILTOWN MOLECULE

CM-3706-R2

HERE'S WHY SO MANY DOCTORS NOW SMOKE AND RECOMMEND

VICEROY

Microscopic analysis shows the Viceroy tip has...

20,000 FILTERS

Twice as Many Filters
AS THE OTHER TWO LARGEST-SELLING FILTER BRANDS
For the Smoothest Taste in Smoking!

COMPARE! HOW MANY FILTERS IN YOUR FILTER TIP? (REMEMBER—THE MORE FILTERS THE SMOOTHER THE TASTE!)

Viceroy
TWICE AS MANY FILTERS
Brand B
Only HALF the FILTERS
Brand C
LESS than HALF the FILTERS
TWENTY
VICEROY

VICEROY'S EXCLUSIVE FILTER IS MADE FROM PURE CELLULOSE—SOFT, SNOW-WHITE, NATURAL!

VICEROY
Filter Tip
CIGARETTES
KING-SIZE

Upjohn

Rheumatoid arthritis, rheumatic fever, intractable asthma, allergies . . .

Cortef* *tablets*

Supplied:

5 mg. tablets in bottles of 50
10 mg. tablets in bottles of 25, 100, 500
20 mg. tablets in bottles of 25, 100, 500

*REGISTERED TRADEMARK FOR THE UPJOHN BRAND OF HYDROCORTISONE (COMPOUND F)

The Upjohn Company, Kalamazoo, Michigan

25 Compressed Tablets
Cortef*, 20 mg.
Trademark, Reg. U.S. Pat. Off.
Brand of hydrocortisone
Each tablet contains
20
Directions for use—See accompanying insert.
The Upjohn Company
Kalamazoo, Michigan

NEW

For Pain-Fre

of everyd

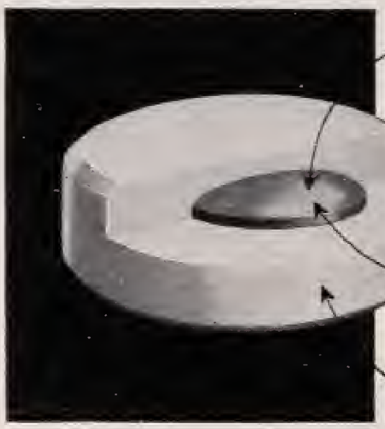
In "Rheumatism

M*ultip*

TEMP

combine:

THE PROPER FORMULA
PROPERLY FORMULATED



Physical separation of the steroid component from the aluminum hydroxide as provided by the Multiple Compressed Tablet construction assures full potency and stability of prednisolone.

PREDNISOLONE *(1 m*

+

ASPIRIN *(0.3 Gm.)* . . . .

+

ASCORBIC ACID *(50 m*

+

ANTACID *(0.2 Gm.)* . . . .

*Early rheumatoid arthritis
Rheumatoid spondylitis
Osteoarthritis
Still's disease
Psoriatic arthritis
Bursitis

Synovitis
Tenosynovitis
Myositis
Fibrositis
Neuritis

erformance

ivities

atients

mpressed Tablets

GEN®

. . . . . for anti-inflammatory, anti-rheumatic benefits *at effective low dosage.*

. . . . . for analgesia plus additional anti-rheumatic activity.

. . . . . for anti-stress support that guards against adrenal ascorbic acid depletion.
(Ascorbic Acid present as 60 mg. Sodium Ascorbate.)

. . . . . dried aluminum hydroxide gel minimizes the possibility of gastric distress.

DOSAGE: *1-4 TEMPOGEN Tablets t.i.d. or q.i.d. (TEMPOGEN Forte, 1 or 2 tablets t.i.d. or q.i.d.) for one or two weeks. Then lower by 1 tablet every four or five days to maintenance level.*

SUPPLIED: *TEMPOGEN and TEMPOGEN Forte —in bottles of 100 Multiple Compressed Tablets. (TEMPOGEN Forte provides 2 mg. of prednisolone.)*

MSD

MERCK SHARP & DOHME
DIVISION OF MERCK & CO., INC.
PHILADELPHIA 1, PA.

Announcing...
a new name

'LANOXIN'

brand

DIGOXIN

formerly known as Digoxin 'B. W. & Co.'®

The new name has been adopted
to make easier for everyone
the distinction between
Digoxin and Digitoxin.

Now simply write: *'Lanoxin' Tablets 0.25 mg. or 0.5 mg.*
'Lanoxin' Elixir Pediatric, or
'Lanoxin' Injection

to provide the unchanging safety and predictability afforded by the uniform potency, uniform absorption, brief latent period and optimum rate of elimination of this crystalline glycoside.

Tablets:	*0.25 mg. (white) and 0.5 mg. (green)*
Elixir Pediatric:	*0.05 mg. in each cc.*
Ampuls:	*0.5 mg. in 2 cc.*

BURROUGHS WELLCOME & CO. (U.S.A.) INC., *Tuckahoe, New York*

The Original
Alseroxylon

Rauwiloid®

for the
Somatic
AND
the Psychic Phase of

HYPERTENSION

In addition to its gentle antihypertensive action, Rauwiloid provides psychic tranquility and overcomes tachycardia. Thus Rauwiloid participates in *both* the somatic and psychic phases of therapy for hypertension. Treatment in *all* types of hypertension may begin with Rauwiloid. 80% of mild labile hypertensives require no additional therapy.

Dosage is definite and easy:
two 2 mg. tablets at bedtime.

Riker
LOS ANGELES

NEW

A

ATARAXOID is a unique, new combination of STERANE and ATARAX, which now permits simultaneous symptomatic control and reduction of attendant anxiety and apprehension in rheumatoid arthritis and other indications.

The added tranquilizer control, desirably easing mental stress, also directly assists clinical progress. It minimizes the chance of exacerbation related to emotional strain and facilitates patient confidence and coöperation in the therapeutic program toward maximum rehabilitation.

ATARAXOID exerts the anti-rheumatic, anti-inflammatory activity of STERANE distinctly superior to previous steroids, effective in radically reduced dosage, and with minimal disturbance of electrolyte and fluid metabolism.

The ataractic effect is a central neuro-relaxing action – the result of a marked cerebral specificity – free of mental fogging and devoid of any major complications: no liver, blood or brain damage. This peace-of-mind component is also used in the lowest dosage range.

Supplied: Each green, scored, ATARAXOID oral tablet contains 5 mg. prednisolone (STERANE) and 10 mg. hydroxyzine hydrochloride (ATARAX). Bottles of 30 and 100.

PFIZER LABORATORIES
Division, Chas. Pfizer & Co., Inc.
Brooklyn 6, New York

the first
and only
ataraxic-corticoid

araxoid*

prednisolone and hydroxyzine

Pfizer

combining the newest, safest tranquilizer, ATARAX® + the newest, most effective steroid, STERANE® (prednisolone)

simultaneously controls
the symptoms and the
apprehension

In Rheumatoid Arthritis,
other collagen diseases,
bronchial asthma and
inflammatory dermatoses

*Trademark

KARO®... meets the need for a completely assimilable carbohydrate in infant feeding

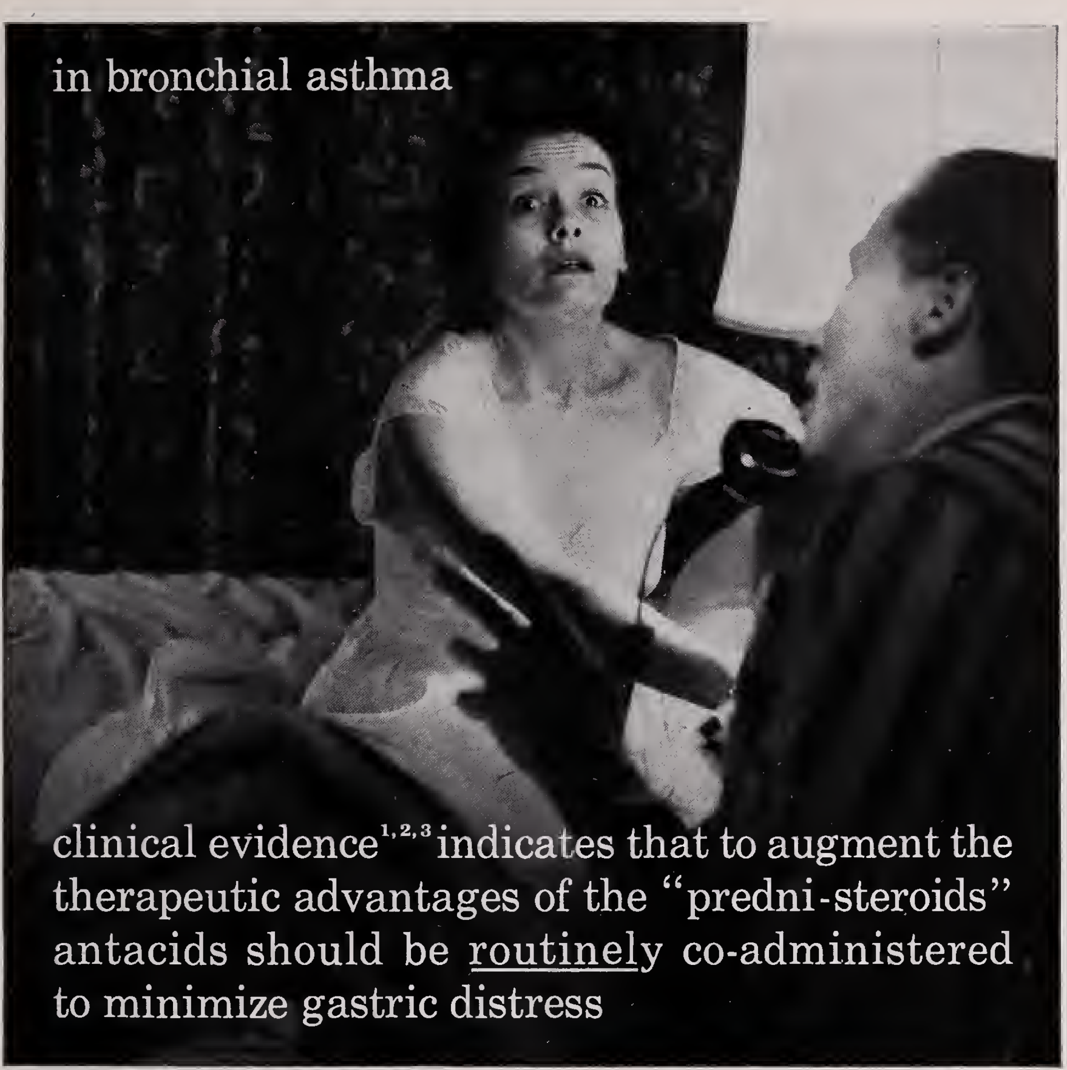
Physicians and parents alike appreciate the efficacy, convenience and economy of Karo Syrup. For this double-rich, readily miscible mixture of dextrin, maltose and dextrose is easily digested, well tolerated and completely utilized.

Three generations of use as a milk modifier have shown that even premature babies thrive on Karo... and that its use does not induce flatulence, colic, fermentation or allergy.

Karo permits easy adjustment of formula and transition from liquid to solid food as circumstances demand. It may be used with sweet, acid, evaporated, dried or protein milk. Light or dark Karo each supply equivalent nutritive and digestive values... yielding 60 calories per tablespoonful.

1906 • 50th ANNIVERSARY • 1956
CORN PRODUCTS REFINING COMPANY
17 Battery Place, New York 4, N. Y.

Karo
SYRUP®
CRYSTAL WHITE



in bronchial asthma

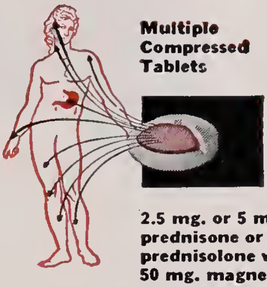
clinical evidence[1,2,3] indicates that to augment the therapeutic advantages of the "predni-steroids" antacids should be routinely co-administered to minimize gastric distress

ROUTINE CO-ADMINISTRATION MEANS

'Co-Hydeltra'

(Buffered Prednisolone)

Multiple Compressed Tablets



'Co-Deltra'

(Buffered Prednisone)

All the benefits of the "predni-steroids" plus positive antacid action to minimize gastric distress.

2.5 mg. or 5 mg. prednisone or prednisolone with 50 mg. magnesium trisilicate and 300 mg. aluminum hydroxide gel.

MSD

MERCK SHARP & DOHME
DIVISION OF MERCK & CO., INC.
PHILADELPHIA 1, PA.

References: 1. Boland, E. W., *J.A.M.A.* 160:613, (February 25,) 1956. 2. Margolis, H. M. *et al, J.A.M.A.* 158:454, (June 11,) 1955. 3. Bollet, A. J. *et al, J.A.M.A.* 158:459, (June 11,) 1955.

'CO-DELTRA' *and* 'CO-HYDELTRA' *are the trademarks of* MERCK & CO., INC.

for a spastic
GUT

Trasentine®-Phenobarbital

integrated relief . . .
mild sedation
visceral spasmolysis
mucosal analgesia

CIBA
Summit, N. J.

TABLETS *(yellow, coated), each containing 50 mg. Trasentine® hydrochloride (adiphenine hydrochloride CIBA) and 20 mg. phenobarbital.*

2/2228M

New STEELINE Pediatric Table

Eases the burden of the physician's daily work

Includes built-in tare balance scale, built-in measuring rod, foam rubber cushion and electrical outlets with cord and plug—there are no accessories to buy. Top quality construction features include all-welded steel body, two roomy drawers and a large open compartment with shelf, providing easy, unhampered access to instruments and supplies. Front edge is protected from wear by a stainless steel baffle plate. Despite the fact that this new table has been designed to provide the physician with the best modern equipment, efficient modern production methods in our own factory permit us to keep the price well below that of comparable models. Write today for complete information.

a. s. aloe company OF MINNESOTA
927 Portland Avenue, Minneapolis 4, Minn. • *Phone:* Federal 8-7601

new

LIPO GANTRISIN 'Roche'

Only two doses a day for round-the-clock effect

When you prescribe Lipo Gantrisin, your patients usually need only two doses daily, for the antibacterial action of a single dose lasts for twelve hours. Lipo Gantrisin 'Roche' is a palatable liquid especially useful for children and elderly invalids.

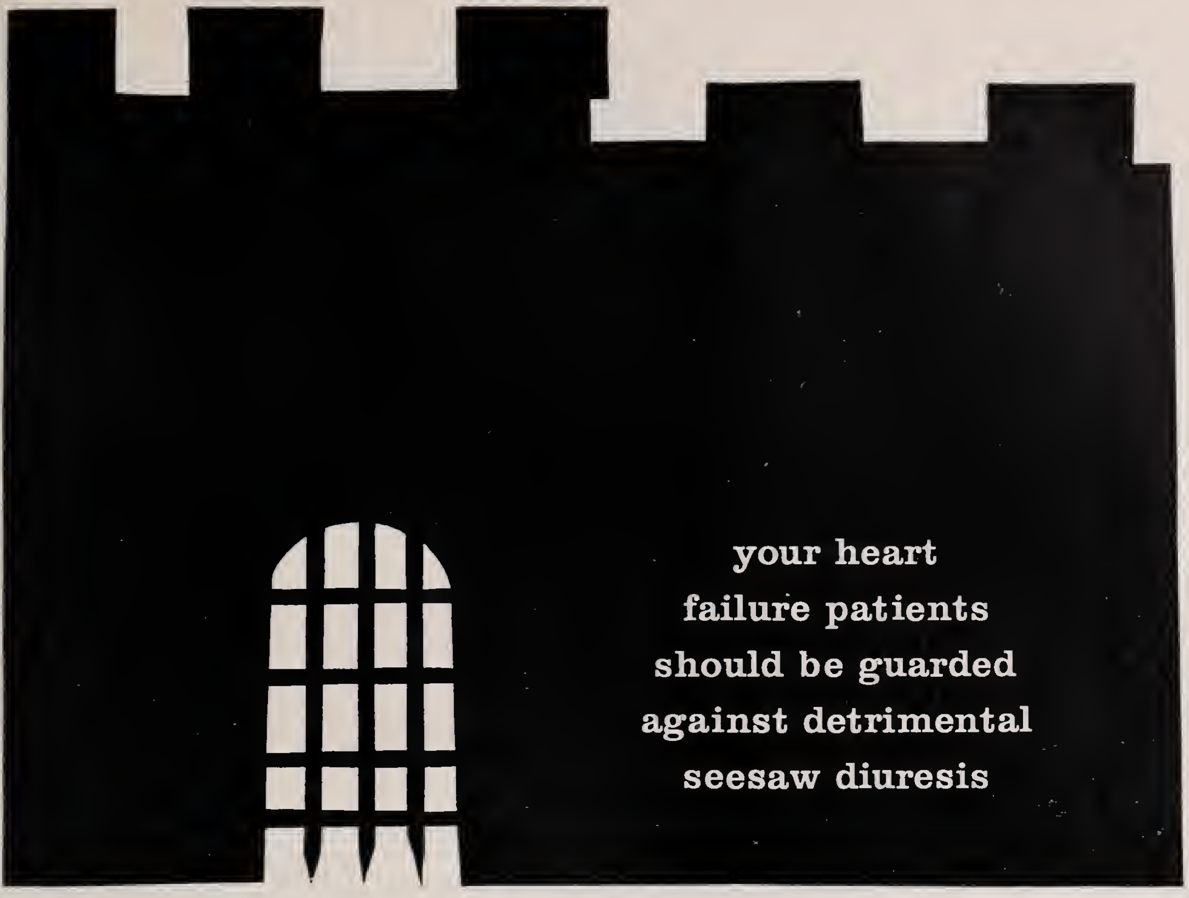
Lipo Gantrisin® Acetyl — brand of acetyl sulfisoxazole in vegetable oil emulsion

For patients pursued by their own emotions —

Noludar 'Roche' will help solve the problem. Not a barbiturate, not likely to be habit forming, 50 mg t.i.d. provides daytime sedation with little likelihood of somnolence, while 200 mg h.s. induces a sound night's sleep, usually without hangover. Noludar tablets, 50 and 200 mg; elixir, 50 mg per teaspoon.

Hoffmann - La Roche Inc.
Nutley 10, New Jersey

Noludar®--
brand of methyprylon


your heart
failure patients
should be guarded
against detrimental
seesaw diuresis

PATIENTS IN FAILURE NEED AN ORGANOMERCURIAL

Limiting dosage to once daily to avoid refractoriness, or omitting alternate days to circumvent gastrointestinal irritation—necessary with some diuretics—results in a seesaw of diuresis with fluid reaccumulation and recurrent strain on the already failing heart.

With the organomercurials, dosage is individualized and administered as needed, to produce sustained, dependable diuresis.

TABLET

NEOHYDRIN®

BRAND OF CHLORMERODRIN (18.3 MG. OF 3-CHLOROMERCURI-2-METHOXY-PROPYLUREA EQUIVALENT TO 10 MG. OF NON-IONIC MERCURY IN EACH TABLET)

a standard for initial control of severe failure

MERCUHYDRIN® SODIUM
BRAND OF MERALLURIDE INJECTION

LAKESIDE

02556

NEW

For Pain-Fr

of every

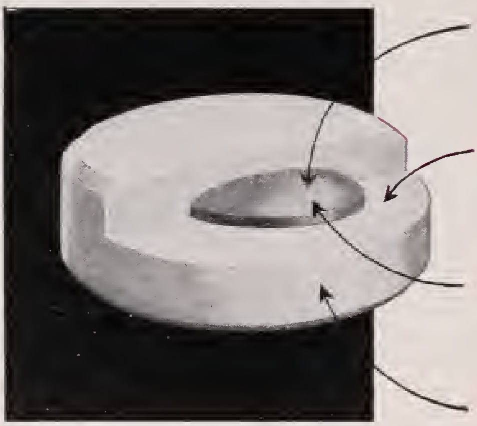
In “Rheumatism”

M*ulti*

TEM

combine:

THE PROPER FORMULA
PROPERLY FORMULATED



Physical separation of the steroid component from the aluminum hydroxide as provided by the Multiple Compressed Tablet construction assures full potency and stability of prednisolone.

PREDNISOLONE (*1*

+

ASPIRIN (*0.3 Gm.*)........

+

ASCORBIC ACID (*50*

+

ANTACID (*0.2 Gm.*)........

*Early rheumatoid arthritis
Rheumatoid spondylitis
Osteoarthritis
Still's disease
Psoriatic arthritis
Bursitis
Synovitis
Tenosynovitis
Myositis
Fibrositis
Neuritis

erformance

ivities

atients

mpressed **T***ablets*

OGEN®

...... for anti-inflammatory, anti-rheumatic benefits *at effective low dosage.*

...... for analgesia plus additional anti-rheumatic activity.

...... for anti-stress support that guards against adrenal ascorbic acid depletion.
(Ascorbic Acid present as 60 mg. Sodium Ascorbate.)

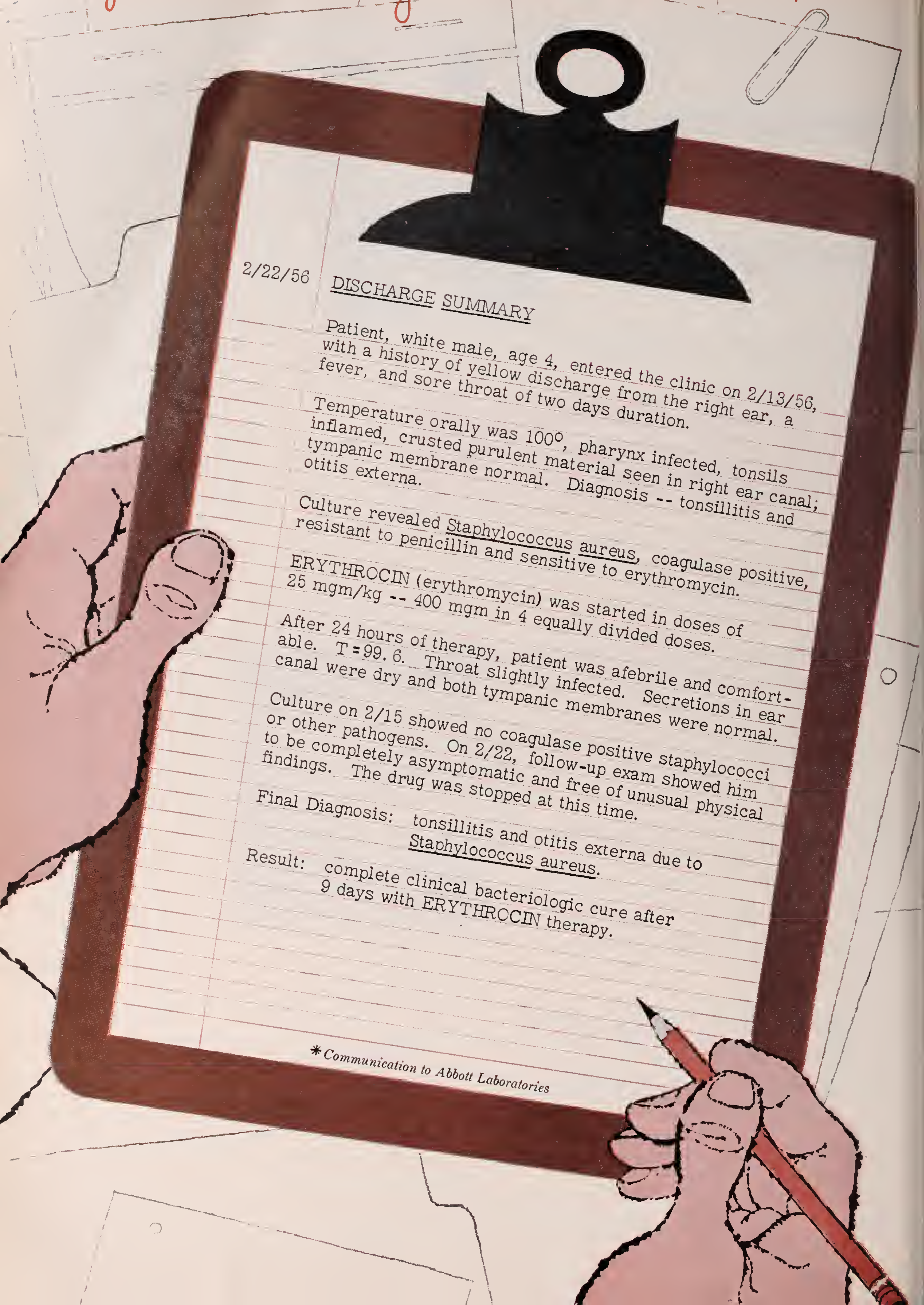
...... dried aluminum hydroxide gel minimizes the possibility of gastric distress.

DOSAGE: *1-4 TEMPOGEN Tablets t.i.d. or q.i.d. (TEMPOGEN Forte, 1 or 2 tablets t.i.d. or q.i.d.) for one or two weeks. Then lower by 1 tablet every four or five days to maintenance level.*

SUPPLIED: *TEMPOGEN and TEMPOGEN Forte —in bottles of 100 Multiple Compressed Tablets. (TEMPOGEN Forte provides 2 mg. of prednisolone.)*

MSD
MERCK SHARP & DOHME
DIVISION OF MERCK & CO., INC.
PHILADELPHIA 1, PA.

Erythrocin in treating tonsillitis and otitis externa*



2/22/56

DISCHARGE SUMMARY

Patient, white male, age 4, entered the clinic on 2/13/56, with a history of yellow discharge from the right ear, a fever, and sore throat of two days duration.

Temperature orally was 100°, pharynx infected, tonsils inflamed, crusted purulent material seen in right ear canal; tympanic membrane normal. Diagnosis -- tonsillitis and otitis externa.

Culture revealed Staphylococcus aureus, coagulase positive, resistant to penicillin and sensitive to erythromycin.

ERYTHROCIN (erythromycin) was started in doses of 25 mgm/kg -- 400 mgm in 4 equally divided doses.

After 24 hours of therapy, patient was afebrile and comfortable. T = 99.6. Throat slightly infected. Secretions in ear canal were dry and both tympanic membranes were normal.

Culture on 2/15 showed no coagulase positive staphylococci or other pathogens. On 2/22, follow-up exam showed him to be completely asymptomatic and free of unusual physical findings. The drug was stopped at this time.

Final Diagnosis: tonsillitis and otitis externa due to Staphylococcus aureus.

Result: complete clinical bacteriologic cure after 9 days with ERYTHROCIN therapy.

**Communication to Abbott Laboratories*

"clinical response good or excellent"

In one recent study, 18 patients with acute follicular tonsillitis and septic sore throat, were given erythromycin. Infecting organism was *Str. pyogenes*. The investigator stated, *"In all 18, the clinical response could be regarded as either good or excellent."*[1]

This, of course, is only one of many reports showing the effectiveness of ERYTHROCIN against coccic infections. You'll get the same good results (nearly 100% in common, bacterial respiratory infections) when your prescription reads *Filmtab* ERYTHROCIN Stearate.

"toxicity lower in erythromycin-treated patients"

After a study of 208 patients treated with erythromycin (78), procaine penicillin (78) and a placebo (52), the investigator stated: "*. . . the incidence of toxicity* (compared to procaine penicillin) *was significantly lower in the erythromycin-treated patients."*[1]

Actually, ERYTHROCIN stands on a remarkable record of safety. After four years, there's not a single report of a severe or fatal reaction attributable to erythromycin. Also, allergic reactions rarely occur. *Filmtab* ERYTHROCIN Stearate (100 and 250 mg.), is available in bottles of 25 and 100, at all pharmacies.

Abbott

® Filmtab—Film sealed tablets, Abbott; pat. applied for.

1. Herrell, W. E., Erythromycin, Antibiotics Monographs, No. 1, p. 29, New York, Medical Encyclopedia, Inc., 1955.
   Idem p. 30.

filmtab®

Erythrocin® STEARATE

(Erythromycin Stearate, Abbott)

611243

From your patient's viewpoint, Doctor . . .

is this the painful part of the treatment?

It can be, unless your patients know the true facts about the cost of medical care. Parke-Davis is reaching millions of people, in LIFE, SATURDAY EVENING POST and TODAY'S HEALTH, with a consistent advertising campaign whose theme is "prompt and proper medical care can be one of life's biggest bargains."

In addition to the magazine advertisements, Parke-Davis makes folder-reprints available for use in pharmacies. Chances are, a large percentage of the prescriptions you write are being packaged with one of these folders explaining the value of modern prescription medicines—reaching your patients right at the time when they are most conscious of the cost. To date, more than six million of these folders have been ordered by pharmacists.

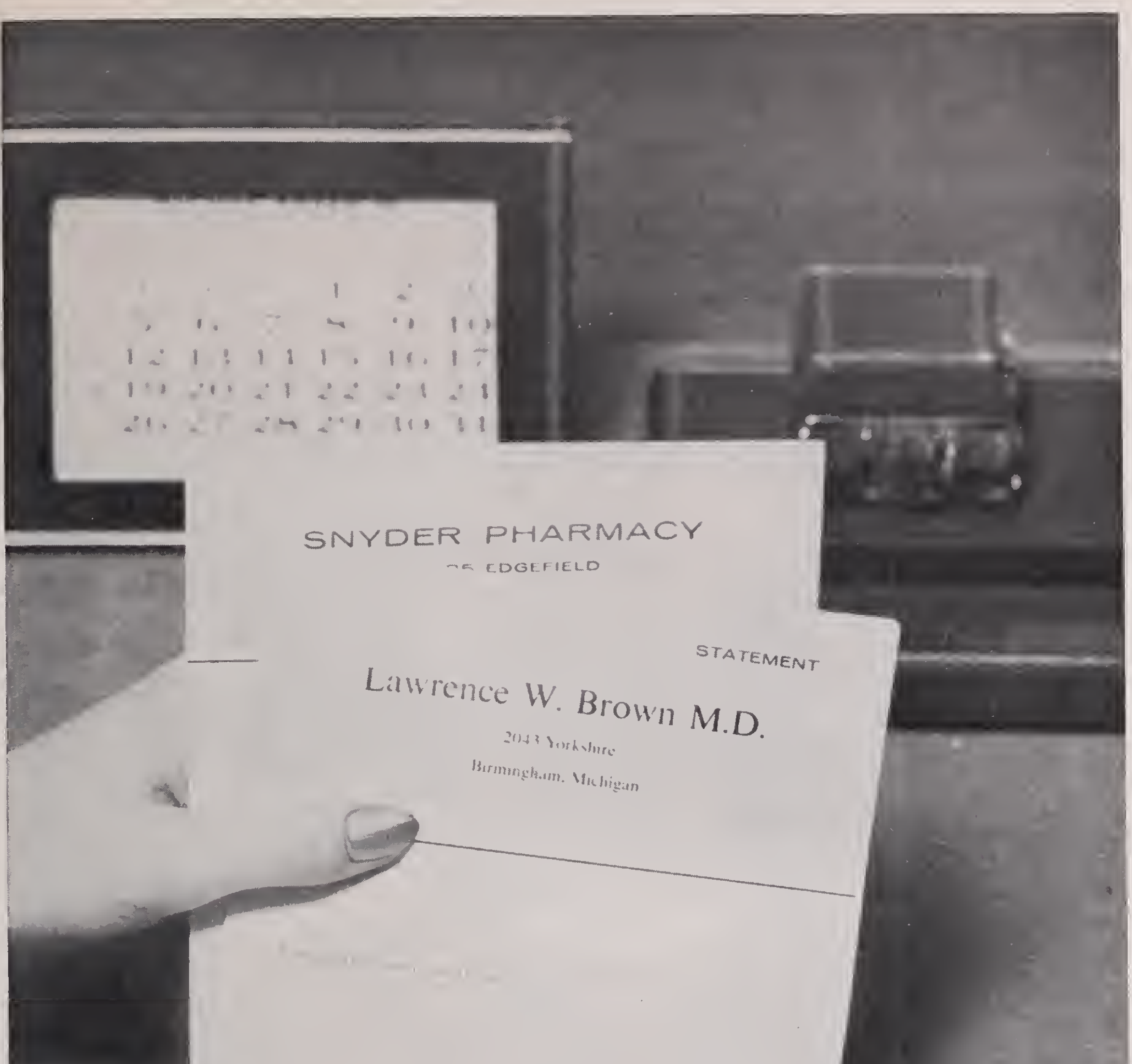
In these advertisements, we strive to present the facts about medical care clearly and unemotionally . . . with the objective of increasing the public's appreciation of why costs and procedures involved are reasonable and fair.

PARKE, DAVIS & COMPANY

PARKE, DAVIS & COMPANY

Detroit 32, Michigan

If you would like reprints of this Parke-Davis "cost of medical care" series, just drop us a line.


SNYDER PHARMACY
EDGEFIELD
STATEMENT
Lawrence W. Brown M.D.
2043 Yorkshire
Birmingham, Michigan

MONODRAL® WITH MEBARAL®

psychovisceral
stabilizer

ANTICHOLINERGIC • SEDATIVE

in peptic ulcer management

- relieves pain promptly
- reduces tension safely
- tranquilizes without dulling
- well tolerated
- promotes healing
- maintains anacidity for hours
- controls hyperactivity of upper gastro-intestinal tract

MONODRAL with MEBARAL—the "psychovisceral stabilizer"—provides for patients with ulcer and gastro-intestinal spasm an effective barrier against the impact of environmental stimuli . . . controls gastric hypersecretion and hypermotility for three and one half to five hours.*

EACH TABLET CONTAINS:
MONODRAL bromide..... 5 mg.
MEBARAL..............32 mg.

DOSAGE: 1 or 2 tablets three or four times daily.
Available on prescription only.
Bottles of 100 tablets.

Winthrop Laboratories New York 18, N. Y.

Monodral (brand of penthienate) and Mebaral (brand of mephobarbital), trademarks reg. U. S. Pat. Off.
**References and clinical trial supplies available on request.*

A Complete Orthopedic Fitting Service

PRESCRIPTION SERVICE BY CERTIFIED FITTERS AT

HOSPITAL—OFFICE—HOME

Camp Supports,
Identical Form Breasts,
Orthopedic Shoes,
Artificial Limbs,
Arms, Braces

For Men, Women and Children

RAY TRAUTMAN AND SON
410 Portland
FE 2-2339
Minneapolis 15, Minn.

Symptomatic relief...plus!

Achrocidin*

Tetracycline-Antihistamine-Analgesic Compound

ACHROCIDIN is a comprehensive formula for treatment of complications of the common cold, particularly when bacterial sequelae are observed or expected from the patient's history or during widespread infections.

Distressing symptoms of malaise, headache, muscular pain, mucosal and nasal discharge are rapidly relieved.

And potent prophylaxis is offered against other diseases, such as otitis media, sinusitis, adenitis, and bronchitis, to which the patient may be highly vulnerable at this time.

ACHROCIDIN is convenient for you to prescribe—easy for the patient to take. Average adult dose: two tablets four times daily.

Available on prescription only

Each tablet contains:

ACHROMYCIN® Tetracycline	125 mg.
Phenacetin	120 mg.
Caffeine	30 mg.
Salicylamide	150 mg.
Chlorothen Citrate	25 mg.

Bottle of 24 tablets

Lederle LEDERLE LABORATORIES DIVISION, AMERICAN CYANAMID COMPANY, PEARL RIVER, N. Y.

*TRADEMARK

Relax the best way
... pause for Coke
continuous quality
is quality you trust
DRINK
Coca-Cola
Work
Refreshed
DRINK
Coca-Cola
REG. U.S. PAT. OFF.

A MODERN
PRIVATE
SANITARIUM
for the
Diagnosis, Care
and Treatment
of Nervous
and Mental
Disorders

MAIN BUILDING—One of 10 Units in "Cottage Plan"

ST. CROIXDALE ON LAKE ST. CROIX

PRESCOTT, WISCONSIN

Located on beautiful Lake St. Croix, 18 miles from the Twin Cities, it has the advantages of both City and Country. Every facility for treatment provided, including recreational activities and occupational-therapy under trained personnel. Close personal supervision given patients, and modern methods of therapy employed. Inspection and cooperation by reputable physicians invited. Rates very reasonable. Illustrated folder on request.

Prescott Office
Prescott, Wisconsin
Howard J. Laney, M.D.
Tel. 39 and Res., 76

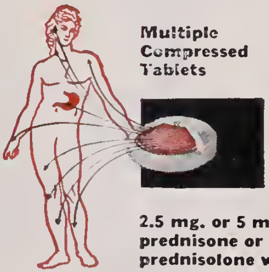
Consulting Neuro-Psychiatrists
Hewitt B. Hannah, M.D., Andrew J. Leemhuis, M.D.
527 Medical Arts Bldg., Tel. FE. 2-1357, Minneapolis, Minn.

Superintendent
Ella M. Leseman
Prescott, Wisconsin
Tel. 69

in inflammatory skin diseases
all the benefits of the "predni-steroids"
plus positive antacid action
to minimize gastric distress

ROUTINELY ACHIEVED WITH **'Co-Deltra'**

(Buffered Prednisone)


Multiple
Compressed
Tablets

'Co-Hydeltra'

(Buffered Prednisolone)

Clinical evidence[1,2,3] indicates that to augment the therapeutic advantages of prednisone and prednisolone, antacids should be *routinely* co-administered to minimize gastric distress.

References: 1. Boland, E. W., *J.A.M.A.* 160:613, (February 25,) 1956. 2. Margolis, H. M. *et al*, *J.A.M.A.* 158:454, (June 11,) 1955. 3. Bollet, A. J. *et al*, *J.A.M.A.* 158:459, (June 11,) 1955.

2.5 mg. or 5 mg. prednisone or prednisolone with 50 mg. magnesium trisilicate and 300 mg. aluminum hydroxide gel.

MSD

MERCK SHARP & DOHME
DIVISION OF MERCK & CO., INC.
PHILADELPHIA 1, PA.

'CO-DELTRA' *and* 'CO-HYDELTRA' *are the trademarks of* MERCK & CO., INC.

a new maximum
in therapeutic
effectiveness

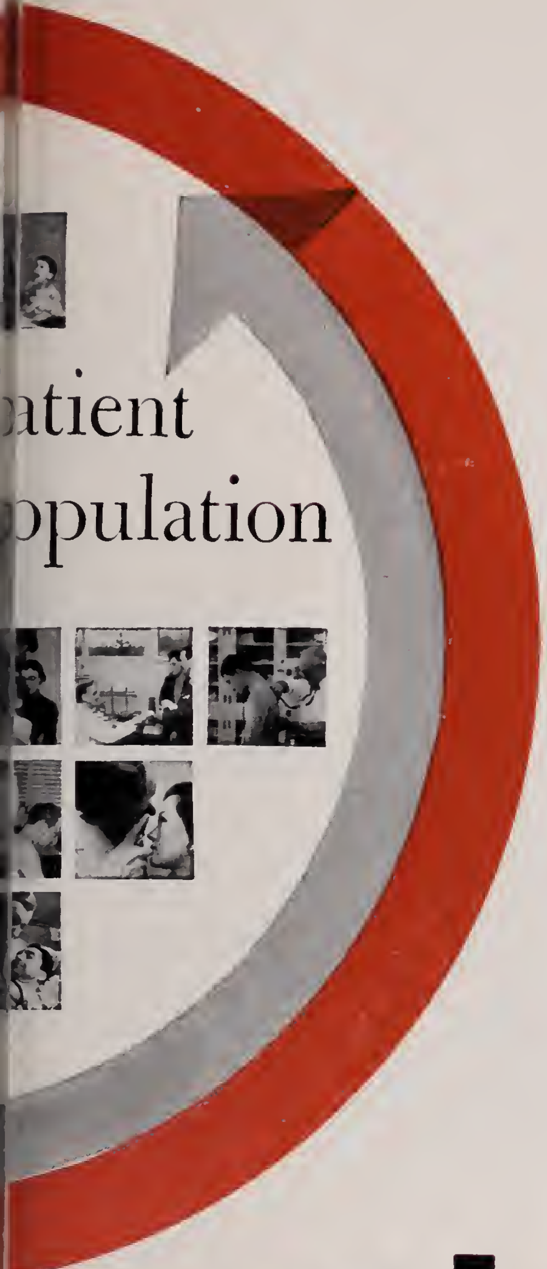
a new maximum
in protection
against
resistance

a new maximum
in safety and
toleration

multi-spectrum
synergistically
strengthened . . .

Sigma

OLEANDOMYCIN TETRACYCLINE



atient
opulation

mycin*

a new certainty

in antibiotic therapy,
particularly for
the 90% of patients
treated at home
and in the office

Superior control of infectious diseases through superior control of the changing microbial population is now available in a new formulation of tetracycline, outstanding broad-spectrum antibiotic, with oleandomycin, Pfizer-discovered new antimicrobial agent which controls resistant strains. The synergistic combination now brings to antibiotic therapy: (1) a new fuller antimicrobial spectrum which includes even "resistant" staphylococci; (2) new superior protection against emergence of new resistant strains; (3) new superior safety and toleration.

*TRADEMARK

Pfizer

"You try
to scrub the
bathtub
with your
back aching
morning
till night!"

"I don't know
about bathtubs,
but two days
ago I couldn't
reach a
shelf higher
than that."

"I thought maybe
I slept in a
draft. Never had
a stiff neck
like this before."

"That's nothing.
I went around
with my arm in
a sling for
nearly two weeks–
had to sleep
with a pillow
at my back
so I wouldn't
roll over on it."

"I thought
I was getting
too old
for high heels–
low heels
didn't help.
My leg hurt
down to
the ankle."

"That's fu
I'm on my
feet all d
but it was
my arms
bothered

... safeguarded relief all the way across th

Prednisone + Acetylsalicylic Acid + Aluminum Hydroxide + Ascorbic Acid
Potent corticosteroid anti-inflammatory action complemented by rapi
analgesia; doubly protected with antacid and supplemental vitamin

"My back was so tight I couldn't even get on and off the bus; now I can climb stairs."
"I hope he helps my knee that quick."
"Take it from me, you should be glad you saw him early in the game so he could do some good."
"Good?— why, he's got me doing exercises I haven't done in years."

pread of common rheumatic complaints

Summated, protective corticoid-analgesic therapy

SIGMAGEN*

corticoid-analgesic compound tablets

- brings specific, complementary benefits to the treatment of muscle, ligament, tendon, bursa and nerve inflammation
- for the initiation of treatment of milder rheumatic disease
- for continuous or intermittent maintenance in more severe rheumatic involvement

Bottles of 100 and 1000.

Schering

prevents postpartum hemorrhage
speeds uterine involution
Lilly
QUALITY / RESEARCH / INTEGRITY

‘Ergotrate Maleate’

(ERGONOVINE MALEATE, LILLY)

. . . produces rapid and sustained contraction of the postpartum uterus

‘Ergotrate Maleate’ almost completely eliminates the incidence of postpartum hemorrhage due to uterine atony. Administered during the puerperium, ‘Ergotrate Maleate’ increases the rate, extent, and regularity of uterine involution; decreases the amount and sanguineous character of the lochia; and decreases puerperal morbidity due to uterine infection.

Supplied:

Ampoules of 0.2 mg. in 1 cc.
Tablets of 0.2 mg.

DOSAGE: Generally, 0.2 to 0.4 mg. I.V. or I.M. immediately following delivery of placenta. Thereafter, 0.2 to 0.4 mg. three or four times daily for two weeks.

80TH ANNIVERSARY 1876 · 1956 / ELI LILLY AND COMPANY

659004

Original Contributions

The Various Mechanisms of Suffocation in Poliomyelitis

BENJAMIN J. BOFENKAMP, M.D.
Minneapolis, Minnesota

IT HAS been stated "with the rarest of exceptions, no patient dies of acute poliomyelitis except as the result of respiratory insufficiency: he can't breathe, so he dies. The patient may be stricken severely, and all four extremities paralyzed, but death occurs only because of inability to cope adequately with the pathological involvement of breathing. This makes early recognition and treatment of respiratory difficulties paramount in handling these patients and in saving lives in this, the only type of poliomyelitis case that dies."[1]

The otolaryngologist, because he is constantly faced with various respiratory problems such as foreign bodies in the airways, croup, cancer of the larynx and postoperative atelectasis, is well able to recognize signs of impending or existing respiratory obstruction. The otolaryngologist, therefore, has become established as an important member on the team for the treatment of acute poliomyelitis.

This presentation of the various mechanisms of suffocation in poliomyelitis is based upon experience gained as the consulting otolaryngologist at The Elizabeth Kenny Institute since June, 1950. From June, 1950, to June, 1954, there have been 3,664 admissions to the Institute, and the total number of tracheotomies performed was fifty-seven. From this experience I should like to propose a simple classification and offer a brief explanation of the various mechanisms of suffocation in poliomyelitis.

Defective Cough Mechanism

Peripheral Respiratory Paralysis.—In an ascending spinal type of poliomyelitis where the virus attacks the thoracic cord, the abdominal and intercostal muscles are paralyzed and as the virus ascends to the cervical segments the phrenic nerve (C_3 and C_4) is attacked, resulting in paralysis of the diaphragm. This is the stage where the artificial respirator is indicated because the patient now exhibits complete peripheral respiratory paralysis.

The mechanism of suffocation in peripheral respiratory paralysis is on the basis of secretory retention due to a poor cough reflex and aspiration of pharyngeal secretions. Because swallowing while flat in bed is even difficult for a normal person, nasal oropharyngeal secretions in spite of the absence of pharyngeal paralysis can be aspirated during the inspiratory phase of the artificial respirator. Nasal oropharyngeal secretions in the normal adult amount to 2,500 c.c. daily (the nose and its accessory sinuses produce 1,000 c.c. and the salivary glands secrete 1,500 c.c.)[2] If these secretions, as is often the case, cannot be properly handled by the swallowing mechanism or by postural drainage and nasal-oral suctioning, they bathe the larynx and are aspirated. Retention of aspirated secretions in the lower respiratory tract results from the inability to cough because the paralysis of the abdominal and intercostal muscles and diaphragm (peripheral respiratory paralysis) abolishes the ability to increase intrathoracic pressure. In order to produce an effective cough the intrathoracic pressure must be raised to 40 mm. of mercury. The usual positive pressure maintained in the respirator is approximately 5 mm. of mercury which is ineffective in producing cough.[3] With retention of secretions in the lower respiratory tract, there is progressive oxygen lack and accumulation of carbon dioxide. Unless the asphyxia is relieved by repeated bronchoscopies or tracheotomy it may result in death.

Presented as an inaugural thesis before the Minneapolis Academy of Medicine on December 20, 1954.

Defective Swallowing Mechanism

Bilateral Pharyngeal Muscular Paralysis.—In bulbar poliomyelitis the cranial nerves commonly involved are the V, IX, X and XI. With the loss of these nerves there results paralysis of the palatal and pharyngeal muscles. The gag reflex is eliminated and there is inability to swallow. To complicate the condition, in this type of bulbar involvement hypersecretion is frequently noted. Furthermore, frequently there is adductor paresis in this bulbar form with inability of the cords to approximate in the midline. Because of the inability to swallow, the secretions flood the larynx and are aspirated into the lower respiratory tract. Although the peripheral respiratory mechanism is intact, even with a normal cough reflex the bulbar patient often retains the aspirated secretions and thus asphyxia occurs.

Defective Airway

Laryngeal Spasm from Irritation of Nasal Oropharyngeal Secretions.—In spinobulbar type of poliomyelitis with the loss of both the cough reflex and the ability to swallow the flooding secretions in the hypopharynx may lead to another means of suffocation. The larynx has been indirectly referred to as being the "watchdog of the lungs."[4] In the normal person, stimulation of the laryngeal surface by any type of foreign body results in spasm of the larynx and an effective cough as the natural mechanism of removing the foreign body. In poliomyelitis cases with normal functioning laryngeal muscles, the retained secretions in the hypopharynx likewise may cause the vocal cords to go into adductor spasm. In the spino-bulbar type, where as it has been noted the cough reflex is abolished, the spasm is prolonged and thus asphyxia occurs.

Abductor Vocal Cord Paralysis Associated with Cricopharyngeal Spasm.—In bulbar poliomyelitis there may be a nuclear lesion involving the nucleus ambiguus with resulting paralysis of the vagus nerves. These patients will have a bilateral abductor paralysis of the vocal cords with the cords fixed in paramedian position. This condition alone results in suffocation unless tracheotomy is performed. In addition to the midline paralysis with involvement of the vagal nuclei there is inability to swallow due to paresis of the pharyngeal constrictors associated with a strong sympatheticotonic contracture of the cricopharyngeus muscle. The cricopharyngeal spasm may precede the vocal cord paralysis and if such occurs there is a flooding of the larynx because of the inability to swallow. This results in abductor spasm with suffocation or aspiration of secretions with secondary pulmonary pathology.

Infrahyoid Muscle Paralysis Producing Obstruction of the Pharynx.—The poliomyelitis virus has a tendency to produce a selective destruction of the various ganglionic cell groups in both the medulla oblongata and the medulla spinalis. Most commony there is noted an ascending type of paresis beginning in the spine and traveling upward, resulting in the spino-bulbar type of acute poliomyelitis.

In the rapidly developing spinobulbar type of case, before pharyngeal paresis sets in, careful observation of the patient may reveal inability of the patient to lift his head from the pillow in spite of normal functioning sternocleidomastoid muscles. This difficulty in head movement is due to disease involvement of the cervical segments C_1 and C_2 by which the anterior infrahyoid muscles are paralyzed. The involved muscles are the sternothyroid, the sternohyoid and the omohyoid. These muscles pull the larynx down and out and with their paralysis there results a contracture in the antagonists, the nonparalyzed suprahyoid muscles, supplied by the V and VII cranial nerves, which nerves have not as yet been attacked. These suprahyoid muscles which pull the larynx up and backward are the mylohyoid supplied by the V, the digastric innervated by V and VII and the stylohyoid innervated by the VII. With the infrahyoid group paralyzed and with excess tonus of the suprahyoid antagonists, the larynx is pulled up and back thus producing mechanical blocking of the airway resulting in suffocation. This condition, although reported only once in the literature, I believe occurs more frequently than is recognized.[5] Among those tracheotomized at The Elizabeth Kenny Institute I have seen six such cases. Its recognition is made by careful observation of the contour of the chin and neck. In the normal individual, the angle formed by the chin and neck is an obtuse angle approximating 135 degrees.

With paralysis of the infrahyoid muscles the hyoid bone is pulled upward and backward by the contracture of the nonparalyzed antagonists, namely the digastric and stylohyoid muscles. As the hyoid is displaced, the contour of the neck assumes an acute angle rather than an obtuse angle. This angle sign, so easily observed if watched for, serves as a warning signal that danger from suffocation is imminent.

Defective Ventilation

Respiratory Center Involvement.—Involvement of the respiratory center itself very rarely occurs. With central nervous system involvement, the marked irregularity in the normal breathing pattern leads to impaired ventilation and anoxia. More often than not the diagnosis of respiratory center involvement is in error. This is frequently demonstrated when methods which establish and maintain an airway are instituted lead to general improvement and further analyses prove the case to be a spinal bulbar type of poliomyelitis. Only thorough knowledge of the aforesaid mechanisms of suffocation will eliminate the possibility of ascribing the symptoms to respiratory center involvement.

Conclusion

The above proposed simple classification and brief explanation of the methods of suffocation in acute poliomyelitis is offered with the hope that it will be of benefit not only to the otolaryngologist but to all members of the team who are called upon to treat acute poliomyelitis.

References

1. Bower, A. G.: Diagnoses and Treatment of the Acute Phase of Poliomyelitis and its Complication. Baltimore: The Williams and Wilkens Company, 1954, p. 2.
2. Best, C. H., and Taylor, N. B.: Physiological Basis of Medical Practice, Fifth Edition. Baltimore: The Williams and Wilkens Company, 1950, p. 494.
3. Strobel, Robert J., and Canfield, Norton: Tracheotomy in poliomyelitis. Arch. Otolaryng., 52:343 (Sept.) 1950.
4. Jackson, Chevalier, and Jackson, Chevalier L.: Diseases of the Nose, Throat and Ear. Philadelphia and London: W. B. Saunders Company, 1946, p. 624.
5. Sjoberg, Arne: Mechanism of suffocation in spinobulbar poliomyelitis and experiences with operative treatment. Arch. Otolaryng., 52:323 (Sept.) 1950.

Discussion

W. R. Schmidt, M.D.: Dr. Bofenkamp has had a unique opportunity to see and treat a large number of patients who have developed interference with the respiratory and swallowing mechanisms as a result of poliomyelitis. He describes at least four different mechanisms by which suffocation or interference with a free airway can occur. While Dr. Bofenkamp has confined his observations to patients with poliomyelitis, it is well to point out that his subject has considerable practical application to other phases of medicine. Any physician who deals with patients in an unconscious or semiconscious state, whether from brain tumor, skull fracture, excessive suppression of the cough reflex in the postoperative period or from a cerebral vascular accident, must be constantly aware of the likelihood of aspiration of salivary secretions and oral feedings into the tracheobronchial tree with the disastrous secondary effects of atelectasis, pneumonitis and eventual suffocation. A knowledge of management of secretions with maintenance of an open airway is an absolute necessity to anyone performing surgery on the intrathoracic viscera. Medical knowledge of these problems has resulted in a marked fall in the mortality rates in a large number of different medical and surgical diseases.

Dr. Bofenkamp is to be complimented not only on a very fine series of observations but also on bringing this most important subject to our attention.

Robert E. Priest, M.D.: I enjoyed Dr. Bofenkamp's paper very much. All of us who have had a part in the training of residents at the University of Minnesota are proud of Ben, and this paper is another justification for that pride. My discussion may be called "The Human Side of the News." In about 1946 we started to do tracheotomies in some of our poliomyelitis cases at Minneapolis General Hospital. We had had no experience with them, but we did them cautiously and only with the idea of helping the patients. We were quite amazed and liberally educated in what happens to people who try out a new idea. We received criticism from quarters which surprised us. However, we persisted, as did the people at the University Hospital. Finally, five years later we reviewed the world literature on the subject to find out what the general attitude had been after a five-year interval. We were pleased to find twenty-eight papers favoring tracheotomy in bulbar polio and reporting a large number of tracheotomies. The papers came from such diverse places as Australia, the Scandinavian countries, and South America, but the bulk of the papers came from the United States. Three papers were very much opposed to tracheotomy in bulbar polio, but it was interesting to note that their authors had never done tracheotomies for bulbar polio.

It is particularly important in considering this subject to remember that one cannot cure the central nervous system disease with an operation upon a peripheral part. The only time that tracheotomy is successful in bulbar polio is when the disease of the central nervous system has not advanced too far and when the prevention of anoxia, hypoxia and pneumonitic complications will turn the scales in favor of the patient.

A Reconsideration of Liver Function Tests

MARK C. L. HANSON, M.D.
Minneapolis, Minnesota

NORMAL liver function is undoubtedly one of the most important bases of over-all body metabolism regardless of the clinical problem at hand. Enumeration of these relationships is not intended nor necessary at this time—indeed, it could not be covered in the time allotted. But because of the widespread implications of its normal and abnormal function, the liver has been the focus of lively attention from the anatomist and pathologist, the physiologist and the clinician, giving rise to an enormous body of information, both fact and fancy. Even in the field of pathologic anatomy of the liver, which has been given new impetus by the great increase of liver biopsy material, there is some disagreement over the significance of a given type of cellular infiltrate, or granulomas, or focal necrosis, and how they may be expected to alter liver function.

We are all aware that there are many tests of liver function. As a matter of fact, in the extreme, one might say that there are very few of all the clinical biochemical tests, available which may not in some way reflect hepatic activities. It has been estimated that there have been recorded as many as five hundred different tests, to evaluate hepatic function.[7] By a long process of largely empirical selection, we have come to recognize certain groups of tests as being most appropriate. However, the particular group of tests any one individual uses may be selected on the basis of tradition, convenience, or personal preference, just to have a series of results which one hopes will delineate the problem. It is not the purpose of this paper to present any new tests which will solve the problems quickly. There are none to my knowledge. Relatively new tests are still being proposed, but they are apparently no more capable of giving simple "black and white" answers. As a matter of fact, it is my aim to point out that we already have far more tests than we may need in any one situation if we make the best possible selection to fit the problem at hand.

In general, liver function tests will find application in the following situations:

1. The differential diagnosis of the cause of jaundice—probably the largest single group of cases.
2. In established liver disease to follow its progress.
3. In non-icteric diagnostic problems to determine the presence or absence of hepatic dysfunction.
4. Evaluation of surgical risk.
5. Detection of malignant metastases in the liver (of increasing importance with the extended criteria of operability, and improved surgical and ancillary techniques).

It should be pointed out that the remaining discussion presupposes the need for extremely careful history and physical examination of the whole patient as the only sound basis for critical application of liver function tests.

The general groups of tests available are:

1. Determination of protein alterations, primarily those circulating in the blood—includes thymol turbidity and flocculation, zinc turbidity, cephalin cholesterol flocculation, colloidal red, et cetera.
2. "Dynamic" tests, those which measure the liver's ability to metabolize or excrete injected or ingested materials acutely, include the bromsulfalein, hippuric acid excretion and galactose tolerance.
3. Biochemical determinations of metabolic products known to have their origin in or alteration by the liver, usually performed on specimens of blood or urine. This group includes such determinations as the serum alkaline phosphatase, serum bilirubin, serum cholinesterase, serum cholesterol and esters, urine urobilinogen, and urine coproporphyrin.

In the problem of selecting the appropriate test or group of tests for a given clinical situation, we have had very little to go on. Most reports of liver function studies concentrate on one test or

---

Presented as an inaugural thesis before the Minneapolis Academy of Medicine on October 17, 1955.

group of tests and tell us only whether it or they differentiate normal from abnormal, or how they may vary in the course of the disease. Actually, very few studies have been made using a whole battery of tests simultaneously. It is generally known that all of the tests of protein alteration are mainly dependent upon changes, usually increases, in the globulin fraction of the circulating proteins.[3] Further, it is usually or largely a change in the gamma globulin, but other factors enter in. For instance, the zinc sulfate turbidity reaction correlates almost quantitatively with an increase in gamma globulin. However, the thymol turbidity reaction is influenced by the presence of beta globulin and perhaps beta lipo-protein fractions; hence, it may be abnormally elevated in such high lipid-content sera as are found in diabetes and nephrosis, but with no liver disease. Incidentally, some recent studies utilizing a group of liver function tests indicate that, contrary to popular belief, diabetes is not regularly associated with hepatic dysfunction.[1] The cephalin-cholesterol flocculation reaction is known to depend upon alterations in the albumin-globulin ratios. Since gamma globulin production is largely a function of the reticuloendothelial system, such diseases as infectious mononucleosis, sarcoidosis, multiple myeloma and the malignant lymphomas exhibit a high incidence of positive flocculation tests, but without true hepatic dysfunction.

The dynamic tests, preferably all intravenous injection procedures, are probably the most reliable and sensitive in demonstrating true impairment of function of the hepatic cells. But here again, certain factors which modify the results must be taken into account. The bromsulfalein and the galactose tolerance tests are based upon the direct measurement of the same material that is injected, whereas the hippuric acid test is at present based upon the measurement of a modification of the injected material which is obtained through the courtesy, not only of hepatic function, but also of renal function. Furthermore, a few years ago we found in patients with liver disease that running the test on successive days resulted in an increased ability to excrete hippuric acid,[12] presumably based upon benzoic acid stimulation of glycine production.[8,10] This would have implications on the interpretation of results obtained in patients being treated with para-amino benzoic acid, which seems to be a fashionable ingredient in many "formula" medications.

In the presence of jaundice, we have been taught that the bromsulfalein tests may not be reliably interpreted. In this situation, where one is usually very anxious to have an assessment of the degree of liver dysfunction, the intravenous galactose tolerance test can readily be used because the test material is metabolized and not excreted. However, because of lack of usage and familiarity, it is not very convenient. In an attempt to increase the usefulness of the bromsulfalein test in this problem, Zieve et al., using a relatively simple statistical technique and reasonable concept, have developed a formula, nomogram, and table by which correction of the bromsulfalein value for the degree of bilirubinemia is practical.[13] This may be of particular value because it has long been recognized that the bromsulfalein test is the single most sensitive to detect hepatic cellular dysfunction.[11,14] That bromsulfalein is specifically handled by the hepatic cells is well shown by the studies of Mendeloff[6] using fluorescent rose bengal, which, when seen in the hepatic cells, actually blocks the uptake of the bromsulfalein.

Another potential use for the bromsulfalein test is proposed by Burnett in England,[2] who reports abnormal retention in twenty-two of twenty-three cases of acute cholecystitis. No more than five cases had any degree of jaundice. All of five surgical biopsies showed pericholangitis and no other parenchymal lesion microscopically. In thirty-two other cases of assorted intra-abdominal inflammation, mainly appendicitis with or without peritonitis, only one showed as much as five per cent retention. Similar normal figures were obtained in chronic cholecystitis and cholelithiasis.

The biochemical measurements of various metabolic products of hepatic function are again static measurements and only by sequential changes give an idea of the course of the liver disease. The determination of the one-minute and total serum bilirubin levels is perhaps the most commonly used. From van den Bergh on, there has been considerable argument as to the validity of the two determinations; whether they have separate significance or measure the same thing and are really chemical artifacts. There is also argument as to whether the prompt direct reacting bilirubin should be considered distinct from the delayed direct reacting fraction. Since the greatest degree of color change occurs in the first minute of the reaction and the remainder tapers off in the next fourteen minutes, the most exact reading can be made in one minute. This has thus become the most standard index of the direct reacting bilirubin. The exact chemical difference in the indirect reacting bilirubin has not yet been determined, but it appears quite certain that it is not due to a combination with a protein molecule.[4] However, it is still true that the direct reacting bilirubin is the fraction that appears in the urine. In a rather extensive analysis of the nature of the significance of the serum bilirubin determination, Zieve and associates[15] found: (1) The one minute bilirubin is more efficient than the total in distinguishing an individual with liver disease. In 110 cases of cirrhosis of the liver 71 per cent had an abnormal one minute bilirubin and only 43 per cent had abnormal total bilirubin values. (2) In obstructive jaundice, there is an almost constant 2:1 relationship between the total and one minute bilirubin, in 100 per cent of the cases regardless of the cause of the obstruction. Interestingly, this holds also for infectious hepatitis, thus tending to confirm the current concept that the jaundice is of the regurgitant type due to rupture of the tiny bile capillaries at their ampullae.

The serum alkaline phosphatase has become widely recognized as an accurate means of differentiating obstructive jaundice from that due to hepatic cell damage. It may remain elevated long after subsidence of jaundice in such cases as cholangitis. It is also being advocated as of considerable help in detecting the presence of intrahepatic metastases,[9] perhaps on the basis of localized obstruction of smaller biliary radicles. This finding is said to be even more reliable when associated with an abnormal bromsulfalein value.[9] Other types of intrahepatic obstructions and granulomas if associated with high alkaline phosphatase values are more likely to be accompanied by abnormal flocculation tests.

The total and esterified serum cholesterol has long been used to evaluate liver function. The total value may vary widely from many other causes and is not very reliable, but a low per cent, usually below 70 per cent, of the esterified form is a much more accurate indicator of hepatic dysfunction. The serum cholinesterase level has also been reported to reliably distinguish normals from abnormals, and is a relatively simple test,[5] but for present considerations it has not been sufficiently evaluated to warrant its routine use. Further use and correlation with other of our most reliable tests are necessary.

The urine provides two much discussed substances, urobilinogen and coproporphyrin, with which to determine the presence or absence of liver disease. The twenty-four hour determinations of each have proven to be the most consistent. The former has enjoyed considerable familiarity in this vicinity and is now widely accepted. The latter has had more circumscribed familiarity here, and much less elsewhere, at least as a test of liver function. The metabolism of the former is relatively well understood, that of the latter poorly, but in critical studies both have been found to be excreted in abnormally high amounts in those conditions associated with hepatocellular damage. Their correlation with liver disease has been highest in cirrhosis, mainly Laennec's, and infectious hepatitis of either form, but also with toxic hepatides.

Thus far this discussion has not served to simplify the problem of what test to use and when. As mentioned earlier, there is a great dearth of reliable studies incorporating a satisfactory selection of tests in a single group of patients with all tests run concomitantly so that intercorrelations might be valid. Many studies are reported where one set of tests is done one day and compared with another group on another. This allows for obvious variation. In the course of organizing a program of testing a group of veterans with and without a history of hepatitis during World War II under the auspices of the National Research Council, Zieve and Hill and various associates[14] were able to run a battery of eleven tests simultaneously, including a combined intravenous bromsulfalein, galactose and hippuric acid infusion.[16] These studies were extended to include numbers of patients with cirrhosis, obstructive jaundice, lymphomas, metastatic hepatic malignancies and serum hepatitis.

This enabled the accumulation of a large body of data in which the time relationship and its effect on the intercorrelations between the tests could not be questioned. Some of the minor fruits of this investigation have been referred to earlier in this paper, but the major portion of the project has had to do with the development of statistical analyses to show which tests were of the greatest discriminatory value. For detailed study of the information available, one may consult the original articles.[14] Analyses were undertaken for two major types of liver disease, namely cirrhosis and

CIRRHOSIS*

Comparative discriminative effectiveness of various combinations of the independently significant tests

Combination	Discrimination Ratio x 100	Formula
	Per Cent	
All nine tests	71.7	
BSP, ZT, HA, UCP	69.6	BSP +0.5 ZT—10 HA +0.03 UCP—13
BSP, ZT, UCP	68.2	BSP +0.5 ZT +0.03 UCP—23
BSP, ZT, HA	64.9	BSP +0.5 ZT—8 HA—8
BSP, ZT	63.7	BSP +0.5 ZT—16
BSP	60.9	BSP

HEPATITIS*

Comparative discriminative effectiveness of various combinations of the independently significant tests

Combination	Discrimination Ratio x 100	Formula
	Per Cent	
All nine tests	79.3	
BSP, ZT, HA, UCP	78.1	BSP +1.3 ZT—12 HA +0.05 UCP—22
BSP, ZT, UCP	76.2	BSP +1.3 ZT +0.05 UCP—33
BSP, ZT, HA	70.8	BSP +1.1 ZT—12 HA—7
ZT, HA, UCP	68.6	ZT—17 HA +0.06 UCP—70
BSP, ZT	66.9	BSP +ZT—18
BSP	53.4	BSP
UCP	52.2	UCP

acute infectious hepatitis. Only nine of the total eleven tests were used in the calculations, and an "abnormality score" was derived for each group of cases. It was determined that there are apparently four groups of factors in liver function which are determined by the tests used. For example, the bromsulfalein test was found to best delineate one set of factors, the zinc turbidity another, the hippuric acid test another, and the urine coproporphyrin the fourth. These four tests were found to contribute independently to the differentiation between normal and abnormal. All the other tests contributed well enough, but only the same type of information and to a lesser degree than the four mentioned. It is of interest that the same tests as a group were best for both cirrhosis and hepatitis, but in varying degree. For example, the bromsulfalein test was relatively far more effective in the cirrhosis group than in the hepatitis group, whereas the urine coproporphyrin was more effective in the hepatitis group than in the cirrhotic group. While these four tests were found to represent four basic sets of factors in liver function, their discriminative effectiveness in abnormals was not decreased much by the elimination of the hippuric acid test. Therefore, it is suggested that if only three of the tests are available, a very significant distinction can be made. (See tables appended from the original.) A positive score from these formulas indicates abnormality, the negative is normal.

Calculation of similar formulas for abnormality scores in other homogenous groups of liver disease, such as obstructive jaundice, metastatic tumors of liver, lymphomas, were part of the project, but time, funds and manpower became otherwise involved and it was unfortunately never completed. However, the implications of this study are interesting. Instead of chasing the rainbow of promise to the pot of gold at the end of every single liver function test and being dissatisfied, we are faced with the concept that there are four main groups of factors in measureable activities of the liver. Each group apparently does influence one or more of the tests we use, but to a varying degree. We are woefully short of understanding what makes up the groups of factors, let alone any one of the factors. This will remain to be elucidated by finer histochemical techniques. The concept does fit perhaps a little better with what we know of the histology of the liver, namely, that it is made up primarily of one type of parenchymal cell, apart from the supportive tissue stroma and reticuloendothelial elements.

Summary

A brief résumé of the more frequently used types of liver function tests has been presented, together with some of the most recent modifications of their applications. One of the most significant modifications of their use is thought to be the development of the concept of four major factors or groups of factors underlying liver function, and detected with independent effectiveness by the tests of bromsulfalein clearance, zinc turbity production, and the excretion of hippuric acid and urinary coproporphyrin. It is suggested that these four tests form a nucleus of any battery. In the presence of jaundice the serum bilirubin determination would be necessary to allow for correction of the bromsufalein value. Where obstruction may be involved the alkaline phosphatase will be very helpful.

References

1. Bradley, R. F.; Sagield, U.; and Schertenleib, F. E.: Diabetes mellitus and liver function. New England J. Med., 253:454 (Sept. 15) 1955.

(Continued on Page 774)

---

*Zieve, L., and Hill, E. An Evaluation of Factors Influencing the Discriminative Effectiveness of a Group of Liver Function Tests. Parts I-IV. Zieve, Hill and Hanson, M. Parts V, VI. Gastroenterology 28: 759, May, 1955 and 28: 914, June, 1955.

Communicability of Infectious Hepatitis

With Special Reference to its Incidence in Student Nurses

ALBERT J. GREENBERG, M.D.
Minneapolis, Minnesota

INFECTIOUS hepatitis has long been known to be a disease which occurs in epidemic form. The mode of infection has been carefully studied only in the last few years, and the degree or extent of its communicability is not yet well understood. It is this problem with which the present report is concerned.

At various times outbreaks have been recorded from all over the world. Hippocrates,[1] for example, recorded cases of jaundice apparently occurring in epidemic form and, in more recent history, in the Civil War, there were over 22,000 cases of epidemic jaundice reported.

Method of Transmission.—Little is said in the literature about the mode of transmission of infectious hepatitis. Careful studies of the nature of epidemics of hepatitis have been reported only in the last ten years.

Early writers stated that infectious hepatitis was airborne or spread by droplet infection. There is little data to support this contention. Viguier[1] felt that it could be transmitted only by direct contact and that its infectivity was low.

Neefe and Stokes[2] reported the first proven transmission of infectious hepatitis in 1945. They had previously given fecal extracts from patients with the disease to volunteers and had thereby produced infectious hepatitis. They studied one epidemic of infectious hepatitis in a children's summer camp and suspected that the water was infected. When samples of this water were later fed to volunteers, infectious hepatitis developed.

Incidence in Student Nurses.—Although from the above it could be assumed that infectious hepatitis was a communicable disease that occurred in epidemics, and that such epidemics had been known since antiquity, little information was available on the extent of its communicability. The more pertinent point related to the extent of risk to an individual caring for a patient with the disease. In order to give advice on this matter, one would require information as to the incidence of the disease among individuals caring for patients with the disorder, preferably where no isolation technique was used.

It was decided to study the incidence of infectious hepatitis among student nurses exposed to the risk of the disease at four general hospitals in Minneapolis. Two of the institutions were private and two were primarily for the indigent. Student nurses were selected for several reasons. First, their health records are easily accessible. Second, they generally come into closer contact with the patients than do other personnel. Third, they fall into an age group which is generally known to have a high susceptibility to the disease.

The time selected for study was a four-year period extending from January, 1950, to January, 1954. The number of cases of infectious hepatitis in these four hospitals during the study period was 208, as shown on Tables I and II. A diagnosis of infectious hepatitis was accepted only when the evidence, as judged by a personal review of the hospital chart, was convincing. The greatest incidence was noted in 1953, when a small epidemic occurred in Minneapolis.

The average number of student nurses enrolled at the four hospitals was in excess of 500 at all times, as shown in Table III. Isolation technique was not practiced on the adult services at the hospitals for the most part; on the pediatric services, on the contrary, isolation technique was rather uniformly used.

The health records of the group of nurses at risk during this four-year period were carefully reviewed. Only one definite case of infectious hepatitis was found in a nurse who cared for a child hospitalized with infectious hepatitis a few weeks before the onset of her illness.

In the health records reviewed, a diagnosis of

Inaugural thesis presented before the Minneapolis Academy of Medicine on April 18, 1955.

TABLE I. INFECTIOUS HEPATITIS IN FOUR MINNEAPOLIS HOSPITALS

Adult Service—Four-Year Period

	1950	*1951*	*1952*	*1953*
A	8	4	3	7
B	2	3	5	12
C	10	8	7	11
D	6	5	18	16
Total	26	20	33	46

Total Number: 125 Adults

possible infectious hepatitis was listed in three additional instances. After critical review, these were not considered to be instances of this infectious disorder. A brief clinical summary of the cases is as follows:

Case Reports

Case 1.—M. J., female student nurse, twenty years of age, was admitted to the hospital May 17, 1950, complaining of lack of appetite. On examination, tenderness was noted in right upper quadrant; the liver was not enlarged. The one-minute serum bilirubin was 0.4 mg. per 100 ml.; the total was 0.8 mg. The initial bromsulphalein (BSP) test was normal. On a subsequent test, a value of 13 per cent in forty-five minutes was observed. The thymol turbidity was 3 units and did not rise above this level during the illness. The other liver functions were normal.

Because of the fact that the liver was not enlarged and there was no jaundice, and also the failure of the thymol turbidity to rise above three units, it was felt that the diagnosis of infectious hepatitis could not be justified in this patient. The subsequent elevation of the BSP test and the initial slight increase of the one-minute serum bilirubin without other supporting evidence was regarded as inadequate evidence for the diagnosis of infectious hepatitis.

Case 2.—T. S., a student nurse, nineteen years of age, was admitted to the hospital March 19, 1951, because of fever. There was no clinical evidence of jaundice. Though right upper quadrant tenderness was noted, the liver was not enlarged. The one-minute serum bilirubin was 0.19 mg. and the total was 1.27 mg. per 100 ml. The BSP test was 4.8 per cent in forty-five minutes. The thymol turbidity was 1.5 units. A critical review of the hospital record yielded no convincing evidence of infectious hepatitis in this patient.

Case 3.—B. E., female student nurse, aged twenty, was admitted to the hospital because of jaundice, nausea and anorexia. The initial white blood cell count was 8,200, with 59 per cent lymphocytes. A blood smear was described as being suspicious of infectious mononucleosis. The heterophil antibody titer was 1:28. Further studies as to the presence of infectious mononucleosis were not carried out.

Since infectious mononucleosis can produce hepatic dysfunction with jaundice, this case cannot be considered to be an unequivocal example of infectious hepatitis.

TABLE II. INFECTIOUS HEPATITIS IN FOUR MINNEAPOLIS HOSPITALS

Pediatric Service—Four-Year Period

	1950	*1951*	*1952*	*1953*
A	1	3	2	1
B	0	0	1	4
C	2	0	2	5
D	1	9	17	35
Total	4	12	22	45

Total Number: 83 Children

TABLE III. AVERAGE NUMBER OF STUDENT NURSES ENROLLED IN FOUR MINNEAPOLIS HOSPITALS

	1950	*1951*	*1952*	*1953*
A	122	144	184	183
B	92	97	87	90
C	169	170	183	190
D	166	181	154	153
Total	549	592	608	616

It should be mentioned that, in the evaluation of the incidence of the disease in student nurses, two factors make for caution in accepting the diagnosis too readily. First, in general private practice many diseases which are characterized by nausea and anorexia are seen which cannot be diagnosed precisely. In a hospital where a diagnosis must be made, hepatitis is sometimes recorded for want of a better diagnosis. Second, student nurses are generally hospitalized more quickly than individuals in the general population because of the practical difficulties in caring for them in their quarters.

In the one definite case of hepatitis, it should be noted that the patient contracted the disease during an epidemic in the city of Minneapolis. Although it is assumed that the nurse contracted the disease from a patient, such might not have been the case because she may have contracted the disease from an individual outside the hospital.

Few studies have apparently been made on the extent of communicability of infectious hepatitis. Capps, Bennett and Stokes[3] reported a high incidence of the disease among student nurses caring for small children. Britten[4] in a recent publication reported the incidence of infectious hepatitis among service personnel in the Navy. He found that the incidence of infectious hepatitis was 2.5 per thousand for enlisted personnel generally and 3.9 for medical and dental personnel. The increased incidence among medical corpsmen was obviously quite small. A member of the medical enlisted personnel is about one in a thousand more likely to get the disease than a member of the nonmedical enlisted personnel.

From the data given in this report, no definite cases of hepatitis in a student nurse could be traced to contact with 125 adult patients over a four-year period.

It is felt that the care of the isolated patient suffers in comparison to the one who is not isolated. In the case of the patient who is desperately ill with infectious hepatitis, the added chore of isolation technique may contribute to a deficiency in the close nursing care which these patients require.

In conclusion, then, in the case of adults the need for rigid isolation technique is debatable, and from the data obtained in this study, one could not justify its use.

Summary

1. In four Minneapolis hospitals, over a four-year period, 1950 to 1954, 208 patients with infectious hepatitis were treated, 125 adults and eighty-three children.
2. The total enrollment of student nurses at these four hospitals averaged 591 per year.
3. Isolation technique was used in the care of the children, but was not generally used for adults.
4. The incidence of infectious hepatitis among student nurses was very low.
5. Only one definite case could be traced to a possible contact with a child having the disease.
6. No case could be traced to contact with an adult with infectious hepatitis.

References

1. Cockayne, E. A.: Catarrhal jaundice, sporadic and epidemic, and its relation to acute yellow atrophy of the liver. Quart. J. Med., 6:1-29 (Oct.) 1912.
2. Neefe, J. R., and Stokes, J., Jr.: An epidemic of infectious hepatitis apparently due to a water borne agent. J.A.M.A., 128:1063-1075, (Aug. 11) 1945.
3. Capps, R. B.; Bennett, A. M., and Stokes, J., Jr.: Endemic infectious hepatitis in an infants' orphanage: Epidemiologic studies in student nurses. Arch. Int. Med., 89:6-23 (Jan.) 1952.
4. Britten, S. A.: Incidence of infectious hepatitis in the Navy. U. S. Armed Forces M. J., 5:648-657 (May) 1954.

Discussion

F. W. HOFFBAUER, M.D.: I should like to commend Dr. Greenberg on his investigation of one aspect of the important problem of the communicability of infectious hepatitis. Doubtless many of us have held the belief that the risk to nurses caring for patients with infectious hepatitis was not very great. Such impressions never rest upon firm ground until someone takes the trouble to make an actual analysis of the situation. Dr. Greenberg referred to the published data of Dr. Capps and his associates indicating a high grade of infection among student nurses at a Chicago orphanage where hepatitis was endemic. As he indicated, however, the initial high attack rate among this particular group of student nurses was due to a complete lack of careful nursing techniques. As soon as the physicians conducting the investigation had an opportunity to appraise the situation, they immediately made recommendations regarding an improvement in the nursing techniques. Subsequently, the attack rate in the nurses concerned fell off very precipitously.

The individuals at risk that Dr. Greenberg has included in his study represent an age group where susceptibility to infectious hepatitis can be assumed to be high. The low attack rate among the student nurses observed over a four-year period would suggest that the communicability of infectious hepatitis to medical personnel caring for such patients is not very great, provided ordinary commen sense hygienic measures are employed. As was pointed out, the complete isolation of adult patients with infectious hepatitis would appear to be an unnecessary procedure. The nursing staff, the physicians caring for the patient and other hospital personnel must realize that the disease is contagious in the same manner that cases of enteric fevers in general are contagious. In this disease, the excretion of the vital agent in the stools of the infected patients seems to be well substantiated. Such patients must be regarded as potentially hazardous; the proper disposal of the excreta from persons ill with infectious hepatitis is essential to prevent spread of the disease.

Pre-Employment Roentgenograms of the Lower Dorsal and Lumbosacral Spine in Young Men

ROLF M. IVERSON, M.D.
Minneapolis, Minnesota

ANOMALIES, structural variations and residual traumatic or pathologic lesions are prevalent in the spines of symptomless backs, particularly in the lumbosacral region, the portion of the employee's back which is frequently subjected to trauma. Papers by Cushway and Maier;[1] Bohart;[2] Breck, Hillsman and Bascom;[3] Barton and Biram;[4] Stewart;[5] and Colcher and Hursch[11] reveal abnormalities in from 44 per cent to 85 per cent of their cases.

There has been a steady increase in the number of so-called "industrial backs" in the past decade. According to William F. Becker,[6] from 1940 to 1950 Ohio had an increase in employment of 31 per cent and during the same period back injuries increased by 132 per cent. A like period revealed a 7 per cent increase in the industrial force of New York and a 43 per cent increase in the number of back injuries. He also cites Minnesota with a 57 per cent increase in its industrial force and an 80 per cent increase in back injuries during the same period. The seriousness of the low back problem is emphasized by a year's experience of the Commonwealth of Pennsylvania with over 6,900 back injuries reported and nearly $1,500,000 in related compensation payments.

Considerable variance of opinion persists as to the significance of anomalies of the lower lumbar spine in regard to low back pain. The editors of the *Year Book of Radiology* in the current issue "caution radiologists and orthopedists to take an extremely dim view of the significance of congenital lesions as a cause of low back pain."[10] Long and Stotz[8] deplore the use of the term "unstable back," a waste basket term applied to chronic back cases in which x-rays show minor variations from normal. On the other hand, many authors seem to feel that the structural variants in the lumbosacral spine are a definite contributory factor. Unfortunately, the etiology of low back pain frequently cannot be solved. We have passed through the sacroiliac and facet eras and are now firmly entrenched in the "disc" era. None of us will deny the significance of the protruded intervertebral disc, but it is hardly the only etiologic factor in low back pain.

Is the pre-employment roentgenographic examination of the lumbosacral spine a worthwhile procedure? Certainly it does not preclude a thorough clinical examination and evaluation. In an attempt to help evaluate the procedure, I will summarize papers by Becker[6,7] in which he gives some pertinent statistical data. Western Electric in Chicago instituted a program in 1950 aimed at the reduction of back injuries by prevention of such injuries in so-called "heavy jobs." Emphasis was on job placement from a standpoint of physical compatability, not job denial. Pre-employment requirements were a careful physical examination, urinalysis and a roentgenographic study of the lumbosacral spine, followed by a critical evaluation of all the findings. The roentgen findings were of great importance in determining an applicant's physical compatability for the job, often the deciding factor. The applicants varied in age from twenty to sixty-five years, the majority being between ages twenty-five and forty. Individuals with marked scoliosis, spondylolisthesis, spinal deformities due to old fractures, unilateral sacralization or lumbarization, advanced hypertrophic changes, rheumatoid arthritis, marked narrowing of an intervertebral joint or a marked increase in the sacrolumbar angulation were not to be assigned to heavy work. Sacral spina bifida, mild scoliosis, moderate narrowing of disc spaces, moderate increase in the lumbosacral angle, residual epiphysitis or completely sacralized or lumbarized vertebrae were considered to be of minor significance; however, a combination of two or more findings was believed to predispose to an unstable back and justified rejection. Among 3,074 men examined for heavy work, 2,240, or 73 per cent, were accepted, and 834, or 27 per cent were declared unfit. On reviewing all injuries for four years before and five years after institution of the

---

Presented as an inaugural thesis before the Minneapolis Academy of Medicine on March 19, 1956.

TABLE I.

ANALYSIS OF PRE-EMPLOYMENT ROENTGEN EXAMINATIONS FOR THE GREAT NORTHERN RAILROAD

Number		Cases (232)	Per Cent
Average Age		22.8	
Normal		116	50.0
Abnormal		116	50.0
Multiple Findings		29	24.9
Total Abnormalities		162	
1. Spondylolysis	2		
Spondylolisthesis	9	11	4.7
2. Transitional vertebrae			
Unilateral	6		
Bilateral	7	13	5.6
3. Hypertrophic changes			
Minimal		6	2.58
4. Fractures			
Body	6		
Transverse process	2	8	3.4
5. Old epiphysitis		6	2.6
6. Opaque media spinal canal		1	0.4
7. Lordosis or steep L-S angle		8	3.4
8. Scoliosis			
Minimal	35		
Moderate	5	40	17.2
9. Spina bifida occulta			
S1	42		
L5	2	44	19.0
10. Ununited epiphyses		2	0.86
11. Slight narrowing L-S joint		6	2.6
12. Schmorl body		8	3.4
13. Postural narrowing		4	1.7
14. Asymmetry facets		3	1.3

TABLE II.

ANALYSIS OF PRE-EMPLOYMENT ROENTGEN EXAMINATIONS FOR THE MILWAUKEE RAILROAD

Number		Cases (304)	Per Cent
Average Age 170 cases		27.64	
Normal		106	34.9
Abnormal		198	65.1
Multiple Findings		92	46.4
Total Abnormalities		372	
1. Spondylolysis	7		
Spondylolisthesis	10	17	5.6
2. Transitional vertebrae			
Unilateral	12		
Bilateral	21	33	10.8
3. Hypertrophic changes			
Dorsal			
Minimal	54	58	19.0
Moderate	4		
Lumbar			
Minimal	24		
Moderate	6	30	9.9
4. Fractures			
Transverse processes		3	0.98
Bodies		13	4.3
Dorsal	12		
Minimal	11		
Moderate	1		
Lumbar	1		
Minimal	1		
Moderate			
5. Old epiphysitis		5	1.6
6. Opaque media spinal canal		2	0.65
7. Laminectomy		1	0.3
8. Lordosis or steep L-S angle		9	2.9
9. Scoliosis			
Dorsal	27		
Minimal	27		
Moderate	0	27	8.8
Lumbar	57		
Minimal	56		
Moderate	1	57	18.7
10. Spina bifida occulta			
S1	58		
L5	5	63	20.7
11. Ununited epiphyses		1	0.3
12. Narrowing L-S joint			
Minimal	12		
Moderate	2	14	4.6
13. Schmorl bodies		6	1.9
14. Postural narrowing		13	4.3
15. Asymmetry facets		2	0.65
16. Sacroiliac arthritis hypertrophic		4	1.3
17. Pelvis			
Fractures		2	
Bone cysts		5	
18. Femur			
Fractures		2	
Bone cysts		5	

TABLE III. COMPARATIVE STUDY

	Great Northern Per Cent	Milwaukee Per Cent
1. Spondylolysis or spondylolisthesis	4.7	5.6
2. Transitional vertebrae	5.6	10.8
3. Hypertrophic changes—dorsal		19.0
lumbar	2.58	9.9
4. Fractures	3.4	5.3
5. Old epiphysitis	2.6	1.6
6. Opaque medium spinal canal	0.4	0.65
7. Lordosis or steep lumbosacral angle	3.4	2.9
8. Scoliosis	17.2	27.5
9. Spina bifida occulta	19.0	20.7
10. Ununited epiphyses	0.86	0.3
11. Narrowing lumbosacral joint	2.6	4.6
12. Schmorl bodies	3.4	1.9
13. Postural narrowing	1.7	4.3

program, they found: (1) a marked decline (67 per cent) in the number of disabling back injuries, and (2) an abrupt decline in the severity rate of the back injuries. In 1948 there were 122 "days lost" per 1,000 shop men. The "days lost" per 1,000 shop men declined rapidly each year after institution of this program, namely, nineteen in 1952, eighteen in 1953 and five in 1954.

In our group we have examined a number of young men for employment with two railroads as switchmen, brakemen, firemen and switchtenders. These men are being examined not because their work is heavy, but rather because their work is hazardous. Routine lumbosacral spine roentgenograms including the lower two dorsal vertebrae were taken for the Great Northern group. Similar roentgenograms were taken for the Milwaukee group, plus additional views of the lower half of the dorsal spine and pelvis and a special AP view of the lumbosacral joint angling the tube 35° toward the head. In the Great Northern group, we frequently consulted with the

TABLE IV.

		Cases	Per Cent
Great Northern Chief Surgeon			
Number of applicants		178	
Rejects		25	14.0
Review of All Cases			
Number of applicants		232	
Rejects—probable		40	17.2
1. Spondylolysis or spondylolisthesis		11	27.5
2. Opaque media spinal canal		1	2.5
3. Moderate scoliosis		3	7.5
4. Transitional vertebrae		12	30.0
Unilateral		6	
False joints	3		
Scoliosis	3		
Epiphysitis	1		
Lordosis	1		
Bilateral		6	
False joints	3		
Steep L-S angle	3		
5. Lordosis with steep L-S angle		8	20.0
Bilateral sacralization	1		
Asymmetry facets	1		
Epiphysitis	1		
Transitional vertebrae	2		
6. Epiphysitis		3	7.5
Hypertrophic changes	1		
Lordosis and scoliosis	2		
7. Fractures body		2	5.0
Degenerative arthritic changes	1		
Total		40	
Multiple findings		17	42.5
Facets at lumbosacral joint		232	
Vertical 15 AP 176 Asymmetrical 41			

TABLE V.

Findings Which are Probably Disqualifying
1. Spondylolysis or spondylolisthesis
2. Hyperlordosis with steep lumbosacral angle
3. Unilateral sacralization or lumbarization
4. Moderate or marked scoliosis
5. Hemivertebrae
6. Bony fusion of vertebrae
7. Opaque media in spinal canal
8. Laminectomy or bone graft
9. Moderate or marked narrowing of an interspace
10. Localized or generalized osteoarthritis
11. Rheumatoid arthritis
12. Bone disease
13. Bone tumors
14. Moderate or marked compression fractures

Findings Which May Be Disqualifying, Especially Two or More
1. Bilateral sacralization or lumbarization
2. Minimal scoliosis
3. Minimal hypertrophic changes
4. Steep lumbosacral angle
5. Epiphysitis
6. Spina bifida occulta of L. 5
7. Minimal to moderate narrowing of interspaces
8. Minimal compression fractures
9. Bone cysts

medical examiners on those cases with abnormalities. In the Milwaukee group, the films and reports were sent to the Chicago office, so we have no record of the final disposition of their cases.

The roentgen reports of both groups have been reviewed. In the Great Northern group, the films were also reviewed and checked against the reports for personal satisfaction as to the accuracy and consistency of the original readings. Following this, I again reviewed all of the films of the Great Northern group in an attempt to find how many cases would be, or probably should be, disqualified for hazardous work in view of the current trends in this field. The findings of the two groups have been tabulated. The comparison of the two groups will not withstand critical analysis as the examinations and the age groupings are not identical and, of course, there are resultant discrepancies in the findings. However, it does indicate some degree of consistency in regard to congenital anomalies as one would anticipate.

The difficult part of this program is to determine which roentgen findings indicate a potential hazard to the employer and to the employee. The approach to this problem must be realistic. In the young age group, spondylolysis and spondylolisthesis, lumbar lordosis with a steep lumbosacral angle, moderate scoliosis, partial or unilateral sacralization or lumbarization of a vertebra, moderate narrowing of a disc space, minimal to moderate hypertrophic changes, rheumatoid arthritis, severe or moderate compression fractures and a residuum of opaque media in the spinal canal indicate physical incompatability for hazardous work. Spina bifida occulta of the upper sacrum is not to be regarded as significant. Minimal fractures, spina bifida occulta of L 5, minimal scoliosis, epiphysitis, Schmorl bodies, ununited epiphyses, slight narrowing of the lumbosacral joint, completely sacralized or lumbarized transitional vertebrae, postural narrowing of a vertebral body and asymmetry of the facets at the lumbosacral joint are of minor significance unless two or more of these findings are present in the same spine. In these cases, consultation between the medical examiner and the radiologist is indicated before a final decision is reached as to the applicant's phyical compatability for hazardous work.

Conclusions

It is to be expected that the roentgenograms of the lumbosacral spine in young men with symptomless backs will reveal anomalies, structural variants or residual pathologic or traumatic lesions in 50 per cent of the cases. It would seem that at least 15 per cent of the applicants should not be employed at hazardous or heavy work if the present trend of industrial back injuries is to be reversed.

My feeling, at this time, is that the majority of the roentgen findings in young individuals are quite minor and too frequent to be regarded as significant, particularly in view of the fact that the roentgen examination taken at the time of employment is or should be available for comparative purposes in the event of future trauma. This fact, I believe, is one of the most important features of this program and in itself will prove the program worth while to employe and employer. It should establish a base line of "fair play" for both the employe and the employer, particularly if the medical profession, the legal profession and industry utilize it properly.

References

1. Cushway, B. C., and Maier, R. J.: Routine examination of the spine for industrial employees. J.A.M.A., 92:701-705, 1929.
2. Bohart, W. H.: Anatomic variations and anomalies of the spine. J.A.M.A., 92:698-701, 1929.
3. Breck, Louis W.; Hillsman, J. Winston; and Bascom, W. Compere: Lumbosacral rotentgenograms of 450 consecutive applicants for heavy work. Ann. Surg., 120:88-93, 1944.
4. Barton, P. N., and Biram, J. H.: Pre-placement x-ray examination of lower back. Ind. Med. & Surg., 15:319-322, 1946.
5. Stewart, Steele F.: Pre-employment examinations of the back. J. Bone & Joint Surg., 29:215-221, 1947.
6. Becker, W. F.: A pre-placement examination program—for workers assigned to heavy jobs. Ind. Med. & Surg., 22:8-10, 1953.
7. Becker, W. F.: Prevention of back injuries through preplacement examinations. Ind. Med. & Surg., 24:486-490, 1955.
8. Long, N. Gillmor, and Stotz, Kenneth: Unstable back in industry. Ind. Med. & Surg., 25:89-90, 1956.
9. Barton, Preston N.: The significance of anatomical defects of the lower spine. Ind. Med & Surg., 17:37-40, 1948.
10. Year Book of Radiology, 1955-1956 series.
11. Colcher, A. E., and Hursch, A.: Pre-employment low-back x-ray survey. Ind. Med. & Surg., 21:318, 1952.
12. Iverson, Rolf M.: Roentgenographic examinations of the lower back on applicants for employment. Journal Lancet, 75:111, 1955.

RECONSIDERATION OF LIVER FUNCTION TESTS

(Continued from Page 767)

2. Burnett, W.: The bromsulfalein retention test in acute cholecystitis and other acute intra-abdominal conditions. Lancet, 1:488 (Mar. 6) 1954.
3. Cantapow, A., and Trumper, M.: Clinical Biochemistry. 5th Ed. Philadelphia: Saunders, 1955.
4. Cole, P. G.; Lathe, G. H.; and Movitt, E. R.: Separation of serum pigments giving direct and indirect van den Bergh reaction. J. Clin. Path., 6:99, 1953.
5. Kaufman, K.: Serum cholinesterase activity in the normal individual and in people with liver disease. Ann. Int. Med., 41:533 (Sept.) 1954.
6. Mendeloff, A. I.: Fluorescence of intravenously administered rose bengal appears only in hepatic polygonal cells. Proc. Soc. Exper. Biol. & Med., N. Y., 70:556, 1949.
7. Knisely, M. H., as quoted by Watson, C. J.: Discussion of symposium on liver disease. Gastroenterology, 14:73, 1950.
8. Quick, A. J.: Conjugation of benzoic acid in man. J. Biol. Chem., 92:65, 1931.
9. Shay, H., and Siplet, H.: Alkaline phosphatase in the diagnosis of metastatic carcinoma of the liver. J. Lab. & Clin. Med., 43:741 (May) 1954.
10. Snapper, I., and Caltzman, A.: Quantitative aspects of benzoyl glucuronate formation in normal individuals and in patients with liver disease. Am. J. Med. 2:327, 1947.
11. Snell, A. M., and Magath, T. B.: The use and interpretation of tests for liver function. J.A.M.A., 110:167, 1938.
12. Zieve, L., and Hanson, M.: Studies of liver function tests. IV. Effect of repeated injections of sodium benzoate on the formation of hippuric acid in patients with liver disease. J. Lab. & Clin. Med., 42:872 (Dec.) 1953.
13. Zieve, L.; Hanson, M.; and Hill, E.: Studies of liver function. II. Derivation of a correction allowing use of the bromsulfalein test in jaundiced patients. J. Lab. & Clin. Med., 37:40 (Jan.) 1951.
14. Zieve, L., and Hill, E.: An evaluation of factors influencing the discriminative effectiveness of a group of liver function tests. Parts I-IV. Zieve, Hill, and Hanson, M. Parts V, VI. Gastroenterology, 28: 759 (May) 1955, and 28:914 (June) 1955.
15. Zieve, L.; Hill, E.; Hanson, M.; Falcone, A. B.; and Watson, C. J.: Normal and abnormal variations and clinical significance of the one-minute and total serum bilirubin determinations. J. Lab. & Clin. Med., 38:446 (Sept.) 1951.
16. Zieve, L.; Hill, E.; and Nesbit, S.: Studies of liver function tests. I. A. combined intravenous bromsulfalein-hippuric acid-galactose test. J. Lab. & Clin. Med., 36:705, 1950.
17. Zieve, L.; Hill, E.; Nesbit, S.; and Zieve, B.: The incidence of residuals of viral hepatitis. Gastroenterology, 25:495 (Dec.) 1953.

Fat Embolism

LOWELL W. WEBER, M.D.
Minneapolis, Minnesota

FAT EMBOLISM is that condition in which liquid fat enters the circulation in globules large enough to cause obstruction in any part of the vascular system.

Fat embolism has been known experimentally since 1669 when Lower injected milk into the veins of dogs. In 1821, Magendie recorded the symptoms and signs of fat embolism. Zenker first recognized the condition in man in 1862, while Warthin in 1913 wrote the first classic account of this syndrome.[1-2]

The embolization of fat probably occurs in every serious accident. In deaths following accidents, fat embolism was almost a constant finding, and in many instances probably a major factor in the fatal outcome.[2] In a study of Korean War casualties, 72 per cent had fat emboli; in 33 per cent the fat embolism was of significant degree, and in 10 per cent of deaths was a major factor in the fatal outcome.[3] In deaths due to accidents, Vance found significant fat embolism in 75 per cent of cases, and in 20 per cent of these deaths it was a major factor.[4] Robb-Smith studied 125 deaths due to injuries and found gross pulmonary fat embolism in forty-one, and of these, twenty-nine, or 75 per cent, died of fat embolism.[2] Peltier studied this problem in orthopedic operations and found fat emboli in the blood in 75 per cent of cases. Fat emboli were found in the blood of 20 per cent of cases following soft tissue surgery. Infrequently fat emboli could be demonstrated in the blood of normal individuals.[5]

The embolized fat is neutral fat, chemically inert, which is emulsified by the trauma. The fat globules range in size from 8 to 20 microns in diameter. Globules 12 microns in diameter are large enough to obstruct the pulmonary capillaries.[6] The source of this fat is the depot fat in the bone marrow and soft tissues, and not from the blood stream. Scuderi, however, feels that an unknown hitamine-like substance liberated from damaged muscle may destroy the normal fat emulsions in the blood and play a role in the production of fat emboli.[1]

The mechanism by which the fat depot is freed from its connective tissue moorings, caused to coalesce, and enter the vascular system is unknown. Tissue conditions believe necessary for fat emboli to result are: (1) mobilized fat, (2) torn patent veins, and (3) local pressure increased over venous pressure.[7] Bone fractures best fulfill these conditions. Improper immobilization and manipulation increase the likelihood of fat embolization. As expected, bone fractures provide the great majority of clinical cases of fat embolism. Other causes include blast injuries, burns, orthopedic operations, soft tissue operations, and injections of various oily substances for diagnostic and therapeutic purposes.[4,8]

Fat embolism may occur in any age group, although it is rare under fourteen years of age.[9] This may be due to less soluble fatty marrow or to inadequate amounts of fat in the marrow.[10] The considerable predominance of males over females, eight to one, is believed due to the increased incidence of trauma in males.

Clinical Picture

Most of the cases of fat embolism are so mild that they do not cause symptoms, and are diagnosed therefore by laboratory procedures only. The typical symptomatic patient has had trauma with fractures, followed by a latent period, symptom-free from a few hours to three or four days, but extending up to nine days. Rarely do symptoms begin after the fifth day. The initial symptoms are apprehension and restlessness, followed by dyspnea, pallor, sweating, and later by cyanosis. Frothy sputum may appear, but little coughing occurs. Pain is usually absent. A sense of thoracic constriction may be noted and is accompanied by extreme anxiety. Stertorous breathing gradually changing to Cheyne-Stokes may ensue as the condition becomes worse. The cerebral symptoms of irritability, insomnia, delirium, and coma, frequently follow if the patient survives the pulmonary insult.[2]

Presented as an inaugural thesis before the Minneapolis Academy of Medicine on October 17, 1955.

For classification purposes, the symtomatic cases have been divided into pulmonary and cerebral types. The pulmonary cases are further subdivided into three types: (1) *peracute*—dyspnea, cyanosis and death in seconds to minutes after trauma; (2) *acute*—pulmonary symptoms in seconds to hours and death in a few days after trauma; and (3) *subacute*—the typical case noted above.[11] Pulmonary and cerebral symptoms usually overlap.

Physical findings reveal an acutely ill patient with a temperature of 103 to 106 degrees, tachycardia and petechial hemorrhages on the upper trunk, shoulders, anterior neck and axilla. These disappear in a few days. Auscultation of the lungs may reveal scattered rales, or nothing, later basilar rales and finally signs of consolidation.

Fat globules have been reported in the retinal arteries on ophthalmoscopic examination.[2] The blood pressure remains normal until shortly before death.

The signs and symptoms subside spontaneously or with therapy unless irreversible pulmonary or cerebral damage has resulted, in which case death occurs. With subsidence of symptoms, complete clearing of pathologic findings is reported to occur.

Laboratory Findings

Significant laboratory tests include the demonstration of fat globules in the urine and blood. Additional laboratory studies include demonstration of fat globules in biopsies of skin petechiae and in the sputum. X-rays of the lungs may reveal pulmonary edema, patchy pneumonitis, or in late cases, areas of consolidation. Right heart dilatation may also be seen. A hemoglobin drop due to local blood loss or pulmonary or cerebral extravasation has also been reported.[12] The white blood cell count is frequently elevated.

Fat globules appear in the urine between the second and the fifth day.[13] They are demonstrable in from 80 per cent to 100 per cent of cases if repeated studies are made. Catheterized urine obtained without the use of oily lubricants is required. It is necessary to obtain the last few cubic centimeters of urine to demonstrate the fat globules in most instances, and centrifugation using a narrow-necked flask or tube increases the chances for a positive test. This test has a high degree of specificity, as only 2 per cent of 350 tests in one study were positive for fat in normal controls.[14]

Fat emboli in the blood plasma or serum may be detected by dark-field examination.[1] Peltier has recently described the technique of fluorescent microscopy employing the water soluble fat stain phosphin 3 R. With this method 3 to 5 cc. of fresh blood are mixed with an anticoagulant and 0.5 cc. of a 1:1000 solution of phosphin 3R dye, and centrifuged for twenty minutes at 2,500 rpm. A drop of the fluid obtained from the meniscus of the centrifuge tube is placed on a clean slide, covered with a cover glass and examined under the microscope using a 16 mm objective for fluorescent microscopy.[5]

Fat globules may be found in the sputum, usually after thirty-six hours. This test is unreliable because of a high percentage (32 per cent in one study) of positive tests in normal individuals.[13] Robb-Smith states, however, that the fat in the sputum in fat embolism is free fat, while the fat seen in cases of chronic pulmonary disease (and in normal patients) is typically present in alveolar phagocytes.[2]

Pathology

Fat emboli may best be demonstrated in the lungs and kidneys. Fresh snippets of lung cleared with 2 per cent potassium hydroxide reveal fat globules in the alveolar capillaries seen as refractile clusters or cylinders with a dark edge.[15] On frozen section, fat is easily demonstrated with osmic acid stain.[15] For the usual staining procedures, sections must be cut thicker than usual, 30 to 50 microns, in order to best demonstrate the fat globules, as the fat droplets are easily dislodged and lost in routine sections.[7]

In patients with fat embolism, all organs of the body may reveal fat emboli. When death occurs within forty-eight hours, the lung pathology is most characteristic. The lungs are heavy and voluminous; they feel firm but not solid, and there is no difference between bases and apices. There is no pleural effusion. The visceral pleura has a marbled appearance with zones of dark hemorrhage alternating with areas of emphysema. On cut sections frothy blood stained fluid exudes. Fat globules can be seen on the surface and extreme congestion is noted.[2]

Pulmonary examination in cases of sudden death reveal no gross findings, while fat emboli in pulmonary capillaries will be seen microscopically. In patients living longer, pulmonary edema, congestion and hemorrhages develop. Free fat globules can be demonstrated in the alveoli a few hours after capillary obstruction.[2] Bone marrow elements may also be found in the pulmonary capillaries.

In acute cases, the brain may show nothing or may show fat emboli without tissue reaction about the capillaries. In cases surviving from several hours to days, fat emboli with perivascular hemorrhages and necrosis especially in the white matter, may be demonstrated. Leptomeningeal hemorrhages are also found. In thirty-one of Warren's one hundred cases, cerebral emboli were found.[7]

The kidney reveals no gross pathology. Fat emboli may be seen in the glomeruli, rarely in the tubules, on sections. Tissue reaction about the emboli is absent.[2,7]

Other lesions include petechial hemorrhages in the pericardium, pleura, skin, conjunctiva, and myocardium, and frequently there is right ventricular dilatation. Fatal myocardial embolism has also been reported. In experimental animals, marked liver necrosis has been reported.

The pathologic changes which result from fat embolism are believed entirely due to anoxia, and not due to the fat *per se*.[1,2,7] There does, however, appear to be an individual tissue response to fat, and it is possible that tissue lipases, such as a pulmonary lipase, may hydrolyze the neutral fat and thus account for the marked tissue reaction in cases surviving many hours to days. The absence of such a lipase may account for lack of tissue response as in the kidneys.

Prognosis

The prognosis depends upon the amount of fat embolized, its degree of emulsification, and the resistance or physical state of the individual. According to Grondahl, only one of 3,000 patients with fat embolism dies, and death following fractures can be attributed to fat emboli in only 1 per cent of cases. Other authors as previously noted found that in deaths due to trauma, fat embolization was the major factor in from 10 per cent to 20 per cent of these cases.

The prognosis in well-controlled animal experiments revealed: (1) the mortality rate varied directly with the dosage of fat injected; (2) the rate of injection was unimportant; (3) death, if it occurred, was always within twenty-four hours; (4) no sex difference was found; (5) dehydration and tourniquet shock greatly increased the mortality rates; and (6) oxygen therapy prevented death in all animals in a study in which 50 per cent of control animals died.[17]

In Warren's series of one hundred cases, the duration of life from the onset of symptoms to death averaged fifty-three hours, with one patient living twenty-five days. Gaus's fourteen patients died between two and seventeen days, and averaged six days.[7]

Treatment

The treatment of the established syndrome consists of oxygen therapy and supportive care. Oxygen therapy, preferably by mask, has been of proven value, both clinically and experimentally. Supportive therapy should include adequate fluid and electrolyte balance and antibiotics to prevent secondary infections. Morphine and blood transfusions should be avoided or used cautiously.[2] Choline chloride was found to be helpful by Monson and Dennis.[18] The use of fat solvents—ether, alcohol, and others—has been advocated, but their value is questionable.

Prophylactic therapy is most important and consists of early and proper immobilization of fractures and avoidance of unnecessary or rough handling during the manipulation of fractures.[18-26] Other recommended procedures include the use of tourniquets during and for one hour following the manipulation of fractures, and the ligation of the superficial or deep femoral veins for tibial or femoral fractures.[19]

References

1 (a). Scuderi, C. S.: Fat embolism. Arch. Surg., 36: 614, 1938.
(b) Scuderi, C. S., Jr.: Internat. College Surg., 19: 508, 1953.
2. Robb-Smith, A. H. T.: Pulmonary fat embolism. Lancet, 1:135, 1941.
3. Glas, W. W.; Grekin, T. D.; and Musselman, M. M.: Fat embolism. Am. J. Surg., 85:363, 1953.
4. Vance, B. M.: The significance of fat embolism. Arch. Surg., 23:426, 1931.
5. Peltier, L. F.: Fat embolism. Surgery, 36:198, 1954.
6. Monson: Quoted by Peltier.[5]
7. Warren, S.: Fat embolism. Am. J. Path., 22:69, 1946.
8. Gaus, H.: The pathology of fat embolism. Arch. Surg., 9:592, 1924.
9. Landois: Quoted by Scuderi.[1 (a), 1 (b)]
10. Speed: Quoted by Scuderi.[1 (a), 1 (b)]
11. Burger: Quoted by Warren.[7]
12. Harris, R. I.; Perrett, T. S.; and MacLachlin, A.: Fat embolism. Arch. Surg., 110:1095, 1939.
13. Scriba: Quoted by Warren[7] and Vance.[4]
14. Musselman, M. M.; Glas, W. W.; and Grekin, T. D.: Arch. Surg., 65:551, 1952.
15. Rowlands, R. A., and Wakely, C. P. G.: Fat embolism. Lancet, 1:502, 1941.
16. Grondahl: Quoted by Vance[4] and Scuderi.[1 (a), 1 (b)]

(Continued on Page 799)

The Return of Mastoid Surgery

GRAHAM G. SMITH, M.D.
Minneapolis, Minnesota

THE RAPIDLY advancing trends in modern medicine have not left otolaryngology an obsolete specialty. Indeed, the contemporary otolaryngologist has assumed a strategic role of importance in the field of plastic and maxillo-facial surgery, radical neck surgery, and bronchoesophagoscopy. No less important than these, however, has been his return to mastoid surgery.

Why do I refer to "the return of mastoid surgery?" Statistical surveys and general observations have revealed a very definite uptrend during the past five years in the volume of surgery performed on the temporal bone as compared with the preceding five-year period. In the pre-antibiotic era of the early thirties, mastoidectomy for acute suppurative processes or chronic suppurative processes and their often attendant intracranial complications was one of the commonest operations performed by the otolaryngologist. Then for a brief period of years, after the antibiotic and bacteriostatic drugs had been in general use for awhile, it seemed as though mastoidectomy all but disappeared from the operative schedules of most hospitals. Indeed, it became quite a problem to find sufficient cases to teach students the diagnosis and treatment of temporal bone disease and its complications. The accompanying tables and graph containing data from three private Minneapolis hospitals and the University of Minnesota Hospitals are submitted to illustrate this trend.

The apparent uptrend in mastoid surgery in the past decade can be attributed to several factors. First among these is the large group of patients ranging from age twenty to age seventy, who are plagued with chronic otorrhea and have varying degrees of associated pathology. This could include cholesteatoma invading or threatening to invade vital structures such as the lateral sinus, the facial nerve, the vestibular labyrinth, or the cranial cavity. There also might be associated polyps and granulation tissue of the external and middle ear, and/or bony necrosis of the remnants of the ossicular chain or any other bony structure of the temporal bone. In general, these are the patients who have suffered from acute disease of the middle ear and mastoid in the pre-antibiotic period and were treated medically or by myringotomy or incomplete mastoid surgery. Because of the difficulty of performing a truly complete radical mastoidectomy using the postauricular approach, the numbers of dry ears obtained were considerably fewer than generally are now obtained by the more direct anatomic endaural approach developed and popularized by Lempert[1] and others. Because of the refinements in surgical techniques, the improvement in anesthesia, better radiographic demonstration, and antibiotic protection, we can practically assure our patients of a dry ear in addition to a "safe" ear. With this assurance, more patients are anxious to become more socially acceptable and feel more secure in the attainment of a dry, nonoffensive and "safe" ear. A "safe" ear is defined as one in which a well epithelialized cavity has been established either by nature or by surgery, which affords protection of vital structures against direct attack by adjacent disease.

A second factor in the return of mastoid surgery involves a small but apparently increasing group of acute cases of mastoiditis in children in which antibiotic resistant organisms are discovered by culture and sensitivity tests. We have found several cases recently where the mastoid was the only apparent source of infection attending an acute glomerulonephritis or acute rheumatic fever. An interesting observation in looking over the groups of acute mastoids seen during the early thirties revealed many to be post-scarlet fever in origin, oftentimes bilateral, frequently presenting a subperiosteal, Bezold's or zygomatic abscess, and not infrequently complicated by lateral sinus thrombosis, meningitis, brain abscess, or facial nerve paralysis. In the last five years, the author has seen one Bezold's abscess, several subperiosteal abscesses, one zygomatic abscess, three bilateral acute mastoid infestions, and two acute cases of meningitis of otic origin.

Presented as in inaugural thesis before the Minneapolis Academy of Medicine on February 20, 1956.

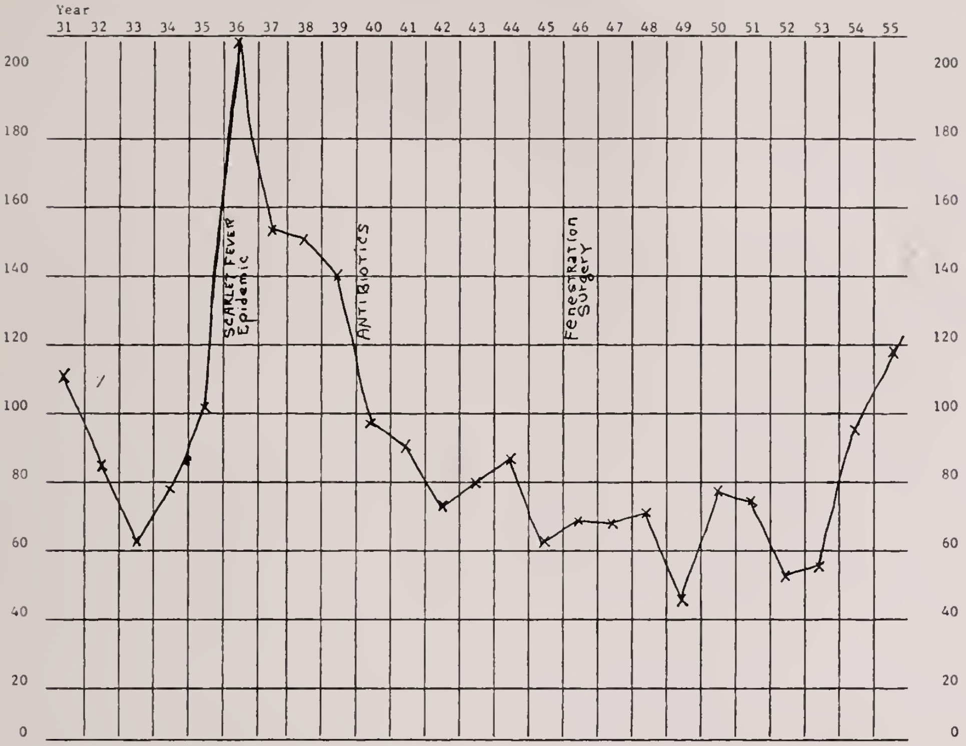


Fig. 1. Numbers of all types of mastoid surgery, 1931-1955. in three Minneapolis hospitals and the University Hospitals.

TABLE I.

Types of Surgery	1931-1935	1936-1940	1941-1945	1946-1950	1951-1955
Hospital No. 1					
Radical Tympanomastoidectomy or Modified Radical Mastoidectomy for Chronic Mastoiditis with or without Cholesteatoma.	1	2	3	3	30
Simple Mastoidectomy or Complete Mastoidectomy for Acute Mastoiditis, Petrositis with or without intracranial complications.	84	90	59	6	22
Mastoidectomy with Decompression of Facial Nerve with or without nerve graft.	0	0	0	0	1
Radical Mastoidectomy for Malignancy.	0	0	0	0	0
Congenital Bilateral Auditory Atresia with or without Fenestration.	0	0	0	0	1
Fenestration.	0	0	0	0	0
Labyrinthotomy.	0	0	0	0	2
Hospital No. 2					
Radical Tympanomastoidectomy or Modified Radical Mastoidectomy for Chronic Mastoiditis with or without Cholesteatoma.	14	11	9	6	25
Simple Mastoidectomy or Complete Mastoidectomy for Acute Mastoiditis, Petrositis with or without intracranial complications.	174	213	94	4	13
Mastoidectomy with Decompression of Facial Nerve with or without nerve graft.	0	0	0	0	2
Radical Mastoidectomy for Malignancy.	0	0	0	0	2
Congenital Bilateral Auditory Atresia with or without Fenestration.	0	0	0	0	2
Fenestration.	0	0	0	0	0
Labyrinthotomy.	0	0	0	0	1

Types of Surgery	1931-1935	1936-1940	1941-1945	1946-1950	1951-1955
Hospital No. 3					
Radical Tympanomastoidectomy or Modified Radical Mastoidectomy for Chronic Mastoiditis with or without Cholesteatoma.	0	1	2	15	33
Simple Mastoidectomy or Complete Mastoidectomy for Acute Mastoiditis, Petrositis with or without intracranial complications.	63	75	61	6	35
Mastoidectomy with Decompression of Facial Nerve with or without nerve graft.	0	0	0	0	2
Radical Mastoidectomy for Malignancy.	0	0	0	0	1
Congential Bilateral Auditory Atresia with or without Fenestration.	0	0	0	0	0
Fenestration.	0	0	0	0	0
Labyrinthotomy.	0	0	0	1	1
University Hospital					
Radical Tympanomastoidectomy or Modified Radical Mastoidectomy for Chronic Mastoiditis with or without Cholesteatoma.	38	69	101	37	76
Simple Mastoidectomy or Complete Mastoidectomy for Acute Mastoiditis. Petrositis with or without intracranial complications.	203	276	52	3	12
Mastoidectomy with Decompression of Facial Nerve with or without nerve graft.	0	0	1	14	10
Radical Mastoidectomy for Malignancy.	0	0	3	1	2
Congential Bilateral Auditory Atresia with or without Fenestration.	0	0	0	1	4
Fenestration.	0	0	0	210	153
Labyrinthotomy.	0	0	1	10	16

The age of speed, modern warfare, and industrialization have undoubtedly contributed to a greater number of head injuries involving the seventh cranial nerve. A certain number of decompression operations on the facial nerve have been performed for some cases of Bell's palsy which have been unresponsive to medical treatment. Where actual damage from temporal bone fractures or where traumatic neuritis from injury can be demonstrated, delay in exploratory surgery is no longer prudent. In order to uncover the course of the facial nerve through the temporal bone, the author usually takes exception to the endaural approach and prefers the postauricular operation for this one type of mastoid surgery. Two patients suffering from complete seventh nerve paralysis due to injury have had normal function restored by this method of decompression.

Malignant disease of the middle ear and mastoid is relatively rare. The incidence appears greater currently because of a more acute awareness of cancer detection and the fact that patients live longer. Cancer around the temporal bone always calls for radical surgery. It is noted that the two private cases appeared in the last five-year span and that the majority at the University Hospital also were found in the period 1951 through 1955.

One of the more recent applications of a more refined type of mastoid surgery has been the correction of congenital atresia of the external auditory canal. The really first successful results in the correction of this deformity was published by Pattee in 1947.[2] He stressed the importance of understanding the embryology of these defects in order to operate successfully each individual case. In general, a complete mastoidectomy with removal of the malformed malleus and incus and careful skin grafting is essential. Some cases require a secondary fenestration procedure for maximum improvement in hearing as advocated by Woodman.[3] The author has successfully treated two caes of bilateral congenital auditory atresia in the past five years, one a child aged ten years and the other a man aged twenty-five years. The latter had to be revised later because of contracture of the canal wall. This patient has been able to discard his bone conduction hearing aid and his audiogram shows a hearing loss of only 15 decibels. The child has been able to carry a normal school program with an improvement of hearing from the 60 decibel level to the 25 decibel level. Neither of these cases required secondary fenestration. The psychologic improvement in the child has been enormous.

Fenestration surgery for selected cases of otosclerosis and even a few cases of adhesive otitis media has been popularized by Lemport and others in recent years. The development and practical application of this procedure came at a very opportune time when mastoid surgery seemed definitely on the wane and the average resident on the otolaryngology service was indeed desperate for any experience in the art of temporal bone surgery. Fortunately, at most of the larger teaching centers, at least one man developed a keen enough interest in this procedure to allow his fellows some experience in techniques of mastoid surgery on living patients. The ever-increasing demand for this operation has made a very substantial contribution to the return of mastoid surgery.

Finally, there is a certain group of intractible cases of so-called Ménière's disease who are so completely incapacitated by their disease, that destruction of the labyrinth is not only justfiable but imperative to the life and health of the patient. The procedure called labyrinthotomy can be done simply, effectively, and safely via an endaural mastoid approach and with tremendous relief to those unfortunate victims of this disease. Since the incidence of labyrinthian disturbances seems to be on the increase, undoubtedly the procedure of labyrinthotomy will also swell the apparent increasing volume of mastoid surgery in the future.

Summary

Statistical reviews of mastoid surgery performed in three Minneapolis private hospitals and the University of Minnesota Hospitals from 1931 through 1955 indicate a definite return of mastoid surgery from an apparent low five-year span between 1946 and 1950.

The reasons given for this return of mastoid surgery are:

1. An improvement in technique offering better results to the chronic otorrheas.

2. An increase in acute mastoditis on the basis of antibiotic resistant organisms.

3. An increase in head injuries requiring decompression of injured seventh cranial nerves.

(Continued on Page 799)

The Eye in Diabetes Mellitus

JOHN P. WENDLAND, M.D.
Minneapolis, Minnesota

EXTENDED longevity of the diabetic patient has increased the incidence of ocular damage to the point where loss of vision has become one of the most important problems the physician must face in the handling of diabetes. The incidence of diabetic changes in the eye in 1925 was approximately the same as it was in 1900, but in 1950 there was a threefold increase in the incidence of this disease compared to the previous periods.[1]

The answer to the cause of eye changes in diabetes is obviously not at hand. However, great strides have been made in the understanding of the nature of the changes within the last ten years and ideas are constantly being voiced as to the etiology of the changes. I would like to bring you our present concept of these changes.

There are three tissues of the eye which are peculiarly susceptible to diabetes—the iris, lens and retina. Diabetic optic neuritis has been described, but is not sufficiently clearly delineated to warrant discussion in this paper.

Iris Changes

Two changes diagnostic of diabetes occur in the iris: rubeosis of the iris and cystic degeneration of the pigment epithelium of the iris. Rubeosis of the iris consists of the proliferation of thin walled new vessels on the surface of the iris, particularly in the angle of the anterior chamber and near the pupillary margin. At first, these vessels can be seen only with the biomicroscope as little capillary tufts, but as they become more numerous they are visible with the naked eye as a red collarette surrounding the pupil. Whether the changes are secondary to impaired venous return in the retina or represent primary capillary disease of the iris vessels cannot be answered, but since the changes seem to occur only in the presence of severe retinopathy and are similar to neovascularization changes in the iris after occlusion of the central retinal vein the former explanation is a logical one. The condition is usually associated with an intractable glaucoma which is often painful and defies all methods of treatment. The diabetic patient with bilateral rubeosis of the iris and glaucoma represents one of the most tragic pictures in ophthalmology. The glaucoma is probably due to interference with aqueous drainage out the canal of Schlemm either by direct mechanical interference by the new formed vessels or from a more subtle derangement of venous pressures in the area.

Cystic degeneration of the pigment epithelium of the iris in diabetics is commonly observed by the ophthalmic pathologist in enucleated specimens. It cannot be seen in life as the change is on the back surface of the iris. The contents of the thin walled minute cysts is said to be glycogen. At the time of cataract surgery the condition can be recognized by the flooding of the anterior chamber with brown pigment as the small cysts rupture from manipulation of the iris.

Fibrosis of the iris muscles and sclerosis of its arteries lead in the long standing diabetic to a small, rigid pupil.

Lens Changes

Alterations in the lens vary from simple refractive error changes to true cataract formation. A sudden myopia means that the diabetes is out of control and that the blood sugar is rising. If the blood sugar becomes stabilized, even though at a high level the myopia will eventually disappear. If the blood sugar is then suddenly lowered through diet or insulin, a hyperopia develops. Osmotic fluctuations in the aqueous humor with secondary alterations in water content of the lens, resulting in curvature and refractive index changes, are responsible for these refractive error manifestations.

The cataract of diabetes may be one of two varieties. It may be the so-called diabetic cataract or it may be a cataract differing in no way from the cataract observed in elderly people not

---

Presented as an inaugural thesis before the Minneapolis Academy of Medicine, February 21, 1955.

suffering from diabetes. The former type is seen only in the young diabetic patient, usually under thirty-five years of age, and is characterized early by the appearance of snowflake-like opacities in the superficial layers of the lens. It usually progresses rapidly to maturity. It is found in from 3 to 16 per cent of young diabetic patients[2] and is similar in appearance to the cataracts of parathyroid deficiency and myotonia artophica. Experimentally, cataracts may be produced in rats by the induction of alloxan diabetes. These cataracts may be prevented by "controlling" the diabetes with insulin.[2] It would thus seem imperative from the standpoint of cataract formation in young humans with diabetes, that as careful control with insulin as possible is indicated.

The second variety of cataract seen in diabetic patients, as we have stated, is the ordinary senile cataract, which occurs with much greater frequency in persons with diabetes than in nondiabetic patients. Sixty-four per cent of all diabetic patients examined have lens opacities of some kind.[3] Whether or not insulin will prevent this form of cataract is not known.

Retinal Changes

The changes which may occur in the retina are as follows: capillary aneurysms, hard exudates, tortuosity and irregularity in caliber of the veins, proliferation of new vessels especially from the venous side of the circulation, retinal hemorrhages, vitreous hemorrhages, retinal detachment and retinal arteriolosclerosis.

The approximate sequence of occurrence of these changes may be expressed in the grading which follows:

Grade I. Retinal capillary aneurysms with or without small retinal hemorrhages.

Grade II. The changes of grade I plus hard exudates.

Grade III. The changes of grade II plus visible changes in the retinal veins consisting either of irregularity in caliber of the veins or proliferation of new venules on the surface of the retina. Often retinal hemorrhages of various sizes.

Grade IV. The changes of grade III plus hemorrhages into the vitreous and proliferation of vessels with connective tissue into the vitreous; retinal arteriolosclerosis; at times retinal detachment.

We must realize that nature does not draw the sharp dividing lines that we do in our classifications. For example, changes in the larger retinal veins sometimes make their appearance as early in the course of the disease, as do the microaneurysms.

It is important to realize that the primary changes in the retina are capillary and venous in nature, and that it is basically these changes which cause the unfortunate train of circumstances eventually culminating in blindness in severe cases. The capillary aneurysms were first described by Ballantyne in 1943[4] and since then have been noted by numerous investigators.[5-7] They appear as small, red, round, smooth-edged dots in the fundus and were for years thought to be hemorrhages. They persist for months and then disappear without a trace, or leave a small yellow dot in their place. They are found in large numbers in the fundus only in diabetes. The arteriolar changes are not responsible for the retinopathy and usually make their appearance concomitant with the onset of hypertension in the patient. Cotton wool patches and papilledema are not observed in uncomplicated diabetic retinopathy. They are usually indicative of a superimposed hypertensive process, although cotton wool patches may be seen in diabetic gangrene or in other conditions associated with severe "toxicity" in the diabetic. When hypertensive changes are superimposed upon the underlying diabetic changes, a mixed retinopathy is said to be present.

The incidence of eye complications of diabetes is directly related to the duration of the disease.[8] About 10 per cent of patients with *known* diabetes for one year or less have retinopathy, whereas 73 per cent with known diabetes for twenty or more years show retinopathy. The relationship between insulin requirement and incidence of retinopathy is not clear. Some diabetics with only moderate requirements appear to develop as severe retinopathy as those with high insulin requirements. Youthful patients who have had diabetes since childhood seem to be most prone to severe retinopathy.

Regarding the pathology of the lesions, microscopic examination of the retina confirms the presence of the small aneurysms. Some of them may be hyalinized. In addition, there is noted an irregular thickening of the basement membrane of the veins and capillaries with both a polysaccharide and lipids, indicating a disturbance of polysaccharide metabolism in diabetes.

Endothelial proliferation of the veins is present. The exudates observed with the ophthalmoscope consist of lipoprotein deposits in the outer plexiform layer of the retina.

There is growing evidence that the kidney damage seen in the diabetic patient is the result of the same pathologic process occurring in the retina. This evidence is as follows. In both locations there is localized proliferation of the capillary walls and a hyaline deposition (in the intercapillary connective tissue of the kidney and hyalinization of some of the retinal aneurysms).[9] The presence of hyaline nodules in the intercapillary connective tissue of the kidney glomerulus is necessary for the pathologic diagnosis of the Kimmelstiel-Wilson syndrome. Ninety per cent of cases showing the Kimmelstiel-Wilson nodules in the kidney will have retinopathy.[1] Also, the more severe the retinopathy the greater the reduction in kidney function.[10] Fifty per cent of patients with retinopathy have albuminuria.[11]

Diabetic Retinopathy

We do not as yet have the solution to the problem of treating and preventing diabetic retinopathy. When the etiology of a disease is not known, it cannot very well be treated satisfactorily. Recent findings implicate several hormones which may be involved in the production of the lesions. Rich[12] has shown that Kimmelstiel-Wilson lesions can be induced in rabbits with cortisone, and Becker [12] has demonstrated that in the animal with alloxan diabetes Kimmelstiel-Wilson lesions and retinopathy can be produced by administration of ACTH. This latter investigator has also noted hypertrophy of the adrenals of patients dying with the Kimmelstiel-Wilson syndrome, whereas diabetic patients dying of other causes show normal size adrenals. Diabetic retinopathy worsens during pregnancy. All these findings may be taken to indicate a complex hormonal imbalance in diabetes and that insulin deficiency is but one facet of this imbalance.

The evaluation of any new therapeutic substance in the treatment of diabetic retinopathy is difficult because of the slow progression of the disease with its spontaneous exacerbations and remissions as hemorrhages come and go. Rutin has proved disappointing in the treatment of diabetic retinopathy. X-ray is sometimes used to the posterior segment of the globe in an attempt to reduce neovascularization, but this must be reserved for cases that are already practically hopeless and thus is of very limited value.

From the clinical standpoint we cannot ignore the fact that some feel that insulin properly administered and diet are the complete answer to diabetic complications. A particularly impressive paper with this viewpoint is one by Sherrill.[9] Certainly, no one has suggested that normalization of the blood sugar is harmful, and in the light of our present knowledge it seems wisest to recommend as careful control of the blood sugar as is possible. A fairly high protein diet is also indicated. Avoidance of wide fluctuations in the blood sugar will certainly reduce the incidence of cataract formation.

Conclusions

1. The retinopathy of diabetes is dependent upon venous and capillary changes in the retina, not upon arteriolar alterations.
2. The changes in the kidney glomeruli and the retina represent the same pathologic process and thus probably share a common etiology.
3. The prevention and cure of diabetic damage to the eyes is not yet at hand. With a disease so chronic and with spontaneous remissions one must view all new treatments with extreme skepticism. However, a constant search for the solution to so serious a problem must be relentlessly pursued through a combination of basic research and clinical evaluation. There is no place for hardening of the categories in the study of this disease.

References

1. Fridenwald, J. S.: Diabetic retinopathy. Am. J. Ophth., 33:1187-1199, 1950.
2. Patterson, J. W.: Development of diabetic cataracts. Am. J. Ophth., 35:68-72, Pt. II (May) 1952.
3. Duke-Elder, Sir Stewart: Textbook of Ophthalmology, Vol. III, p. 3204. London: Henry Kimpton, 1940.
4. Ballantyne, A. J.: Retinal micro-aneurysms and punctate hemorrhages. Brit. J. Ophth., 593, 1944.
5. Gartner, S.: Ocular pathology of diabetes. Am. J. Ophth., 33:727-740, 1950.
6. Hartford, John J.: Retinal vascular changes in diabetes mellitus. Am. J. Ophth., 36:324-330, 1953.
7. Goodman, J. I.: Vascular lesions of diabetes mellitus. Am. J. Ophth., 36:957-966, 1953.
8. Wagener, H. P.: Retinopathy in diabetes mellitus. Proc. Am. Diabetes A., 5:203, 1945.
9. Sherrill, J. W.: Diabetic retinitis: the relationship between retinal degenerative changes and the degree of diabetic control. Bull. Scripps Metab. Clin., 2: Oct., 1951.
10. Post, L. T., and Stickle, A. W.: Fundus changes in juvenile diabetics. Am. J. Ophth., 34:1119-1125, 1951.
11. Dolger, H.. Vascular damage in diabetes. J.A.MA., 134:1289, 1947.
12. Rich and Becker: Cited by McLean, Society Proceedings. Am. J. Ophth., 39:95 (Jan.) 1955.

Discussion

James Myhre, M.D.: Perhaps the most practical point in prevention and control of diabetes lies in the fact that nine out of ten diabetic patients are obese.

A rough thumb rule, which like most thumb rules is oversimplified, is that a young diabetic patient who survives twenty years is likely to develop severe diabetic retinopathy, a condition which progresses very slowly. Generally, then, for an internist who finds most of his new diabetic patients having their onset at between forty and seventy years of age, diabetic retinopathy does not become a major problem. To an internist, one of the most interesting facets of the diabetes is the occurrence of premature vascular disease. It was formerly rather blandly connected with the hypercholesteremia observed in poorly-controlled diabetes. We have now come a long way past this and are getting into Gofman particles, and so far have netted nothing concrete or conclusive out of this. It seems quite certain that good control of diabetes is not a sure preventive of vascular disease.

There are two widely divergent schools of thought in the control of diabetes. This is very confusing to physicians and must be much more so to the patients. One group, which could be called the Boston or the Joslin group, feels that the duration of the diabetes is correlated directly with the incidence of vascular disease, but that another factor—the degree of control—is much more important. In their group classified as having excellent control, they have minimized the incidence of vascular complications in the patients as a group. They feel ideal control is unobtainable with present therapeutic approaches and their varying degrees of control, namely excellent, good, fair, and poor, are just varying degrees of inadequate control, in that we do not have a constantly normal blood sugar and sugar-free urine.

The other group is the New York or Tolstoi group. These people feel that glycosuria and a free diet with liberal usage of insulin to cover the patient's diet are not incompatible with feeling well. Their object is to keep the patient from developing ketosis. They feel, but have not proved, that the vascular disease is inevitable and not delayed by the Boston type of rigid control. Recently it appears that patients tend to become too heavy on this liberal regime and require very large doses of insulin, and often voluntarily go back to more restricted diets.

Some years back it seemed that problems relative to diabetes were answered when insulin was discovered for this insulin-deficiency disease. We are now realizing that the problem is much more broad than that of a simple deficiency disease.

In approximately 1943, alloxan, a normal constituent of the body, was injected into experimental animals. It caused a selective necrosis of the beta cells of the Islets of Langerhan and experimental diabetes. In approximately 1946 it was noted that prior injection of glutathione, another normal substance of the body, prevented development of alloxan-induced diabetes. Since then, temporary diabetes has been shown to be induced by ACTH and it appears to be temporarily inhibited by glutathione. Perhaps these are the early steps to finding the cause of diabetes and possibly even its prevention.

Moses Barron, M.D.: The papers on diabetes this evening were well presented. One of the phases discussed was that of the changes in the retina. Retinal changes seem to progress in many cases of diabetes in a manner that does not run parellel with the severity of the disease. Many severe cases of diabetes have only mild retinal changes, while some mild types of diabetes develop a progressive downhill course in the pathology of the retina. A disconcerting thing about this is that it has been shown by Dr. Dolger and his group that severe retinal changes occur almost as frequently in a diabetic patient who is very well under management and control as in those who are out of control. Kidney changes also follow certain cases of diabetes. Some cases have a terminal state of uremia from intercapillary glomerulonephritis. These changes also may progress even under proper dietary control. The conditions which respond to treatment and proper management are acidosis, diabetic coma, and to some extent the development of arteriosclerosis. In the pre-insulin era, the principal cause of death with diabetes was diabetic coma, probably contributing to sixty per cent of the diabetic deaths. This final stage has been almost eliminated through modern management and diet plus insulin. Probably not more than from 3 to 5 per cent of the patients with diabetes end in acidosis. In some clinics the percentage is even lower. The development of arteriosclerosis, which may result in so-called diabetic gangrene or in some cases in coronary disease and thrombosis, can be somewhat controlled by proper management. But, unfortunately, arteriosclerosis and gangrene are much too common in spite of the great improvement in diabetic control.

The dietary management has changed considerably from the time that Joslin used to teach the so-called diabetic mathematics. Patients are given a much more liberal diet. We usually find that the strict elimination of sugar from the diet is about all that is necessary in all but the severe cases of diabetes. There are certain authorities like Tolstoi of Brooklyn who try to manage diabetes by little dietary control but only through use of insulin to keep the patient sugar-free part of the time.

There are a number of different types of insulin now available. Each has its proper function. At first we had only the regular insulin which still has its usefulness in the mild forms of the disease and especially in the treatment of acidosis and diabetic coma. Protamin zinc insulin provided a great boon in the treatment because it produces a long-acting insulin which helps greatly in diabetic management. Nph has proved very useful, and at the present time most of the cases can be well controlled by nph insulin given only once daily before breakfast and in the severe case by having it mixed with small doses of regular insulin. The latest long-acting insulin is Lente. This insulin has proven useful in the very severe cases in which two injections have to be given daily. A larger dose is given before breakfast and a smaller one before the evening meal. I have been able to get several very fragile cases satisfactorily under control through the use of Lente insulin.

Carcinoma of the Laryngopharynx

HAROLD S. ULVESTAD, M.D.
Minneapolis, Minnesota

CARCINOMA of the laryngopharynx presents serious therapeutic problems. Not many years ago it was looked upon as a hopeless condition for which even palliative treatment could do little to ease the discomfort of the patient. Prior to the 1920's extensive excisional surgery was attempted by a few men and a few cures were actually obtained. However, the operative mortality and the recurrence rate were both so high that such a procedure was unacceptable to both the doomed patient and the doctor.

The treatment of cancer with fractional doses of radiation was initiated in the early 1920's. Until the 1940's this was practically the only treatment used for carcinoma of the laryngopharynx. More successful palliation and occasional cures were obtained as the technique and equipment improved. However, in its present state, radiation therapy has definite limitations in the treatment of this condition. Cervical metastasis are present in a high per cent of the patients by the time the diagnosis is made. Even though the primary lesion is destroyed or controlled there is little effect on the secondary spread. Many of the tumors in this area are of relatively low radio sensitivity. Occasionally radionecrosis of the laryngeal cartilages produce enough stenosis or secondary infection to require a total laryngectomy.

Since the early 1940's there has been an increasing reversion to wide field surgery as a treatment of choice. The excellent work of Wookey and others has stimulated increasing interest in this field. Improvements in surgical technique, in anesthesiology, and in the control of the patient's nutrition are all vital factors. These, together with the chemotherapeutic and antibiotic agents produced a drop in operative mortality from 50 per cent to less than 2 per cent. The resulting increase in the five year survival rate is evidence that extended and extensive surgery offers much in the treatment of carcinoma of the laryngopharynx.

Cancer in this region is by no means uncommon. Nearly 1 per cent of all deaths from malignant disease are due to carcinoma of the hypopharynx and cervical esophagus. A brief review of the anatomy of this region is in order for a proper understanding of the problems involved. From the point of view of feasible surgical excision, it may extend from the soft palate to the level of the supra-sternal notch. The intrinsic larynx includes the vocal cords and the immediate sub-glottic and supra-glottic areas. The curability of intrinsic laryngeal cancer properly treated is high—80 to 90 per cent in cancer confined to a vocal cord, 50 to 70 per cent by total laryngectomy for more extensive lesions. Radiologists have obtained comparable results in the treatment of small lesions confined to a single cord. Hoarseness is an early symptom leading to an early diagnosis. Intrinsic carcinoma of the larynx is slow to spread, either by the lymphatics or by direct extension.

The extrinsic larynx includes the epiglottis, the aryepiglottic folds and arytenoids and usually the postcricoid region, although the latter actually forms the anterior wall of the hypopharynx. The hypopharynx lies on the sides and behind the larynx from the hyoid level to the sixth cervical vertebra behind the cricoid cartilage. Because of the intimate relationship between the hypolarynx, larynx and the cervical esophagus, cancer involving one not infrequently spreads to one or both of the other structures. The lymphatic supply to all three is abundant and early spread to the cervical nodes is the rule. The superior deep cervical nodes along the internal jugular vein and the pretracheal and peritracheal nodes are usually the first to be involved. The inferior deep cervical nodes are usually involved late and secondarily. The lesions are predominantly squamous cell carcinomas that are relatively radioresistant. This is in contrast to the radiosensitive transitional cell carcinomas found in the nasopharynx.

Symptoms of carcinoma of the extrinsic larynx and hypopharynx that lead the patient to the doctor usually appear late. He may complain of a roughness or sticking feeling in the throat, perhaps

---

Presented as an inaugural thesis before the Minneapolis Academy of Medicine on December 15, 1952.

a bad breath. Persistent pain in the ear may be present several months before the onset of dysphagia. Swelling of the neck from metastasis may be the first complaint. Hoarseness and cough are usually late symptoms. Hoarseness may be due to invasion of the larynx or to involvement of the recurrent laryngeal nerve. A carcinoma starting in the postcricoid region usually produces dysphagia earlier because of the normally smaller lumen of this part of the esophagus. Statistics on the sex incidence of cancers in this area are interesting. Cancer of the larynx is ten times as common in men as it is in women. Cancer of the esophagus occurs in the male 80 per cent of the time. However, cancer in the immediate postcricoid area of the hypopharynx develops almost exclusively in women.

Three factors favor the surgical treatment of cancer of the laryngopharynx and cervical esophagus: (1) Although spread of the cancer to the cervical nodes is often early, more widespread metastasis usually occur late or not at all. Wookey made a postmortem examination of seventy patients dying of cancer of the hypopharynx and esophagus. Widespread metastasis was common when the lesion involved the lower part of the esophagus but did not occur at all from the hypopharynx or cervical esophagus. (2) The cervical lymphatics are excessible and can be excised without sacrificing vital structures. (3) Excision can be very extensive. Part of the soft palate, the tonsil pillars, the walls of the hypopharynx, the larynx, the thyroid gland and the cervical esophagus may be sacrificed if necessary. These structures are removed *en bloc* along with their lymphatic bed. The latter may include the sternocleidomastoid, sternohyoid, sternothyroid, mylohyoid, digastric muscles, the hyoid bone, the internal jugular vein, the hypoglossal, lingual and spinal excessory nerves, the contents of the submaxillary triangle as well as the fat and lymphatics in the anterior and posterior triangles.

If cervical nodes are not palpable, the regional lymph nodes are removed on the side showing the predominant growth of tumor. If metastases appear at a later date on the contralateral side, then the patient is subjected to a second radical dissection of the neck glands. The importance of including a neck dissection as a routine part of the procedure is indicated by the fact that as high as 71 per cent in a series of extrinsic carcinomas of the larynx showed cervical lymph nodes metastasis. In another series, Ogura and Bello found positive nodes in 40 per cent of patients who had had a radical neck dissection for extrinsic laryngeal cancer even though no nodes were palpable at the time of surgery. Surgical removal of the larynx is a mutilating procedure. Nevertheless, there should be no hesitancy in this matter if it means the saving of a life. Probably 75 per cent of laryngectomized patients can develop a useful esophageal voice. Most of the remainder can use an artificial larynx satisfactorily.

In many cases it is possible to obtain a primary repair of the esophagus with the tissues immediately available. If there is insufficient laryngeal or esophageal mucosa left to form an adequate tube there are two alternatives. The mucosa of the pharyngeal and esophageal stomas may be attached to the skin and left for later repair. This usually consists of mobilizing a full thickness graft from the skin of the neck and turning it in on itself to form a tube which is sutured superiorly to the pharyngeal stoma and inferiorly to the esophagus. The resulting defect in the skin of the neck can then be covered with a split thickness graft. Another method of secondary repair is the development of two pedical grafts from the anterior chest, bringing them up in parallel fashion to the repair site and then forming the skin tube.

The second alternative is the immediate repair of the defect with a split thickness graft. This is converted into a tube by suturing around a stent of flexible plastic material. The stent is then allowed to remain in place until after active scar formation has subsided. This immediate repair saves much time and the several procedures usually necessary for a delayed reconstruction. There is a greater tendency for the split thickness skin tube to constrict down, however. The full thickness tube, once it is completed, usually does not present this problem.

Swallowing through a skin tube is usually surprisingly satisfactory. All but the coarsest foods can be handled without much difficulty. At times food may lodge temporarily but can be washed down with fluids. The patient does well from a nutritional standpoint and is able to lead an essentially normal life.

The general condition of the patient is more important than the age when one is attempting to

(Continued on Page 811)

Treatment of Atrioventricular Block

A. CABOT WOHLRABE, M.D.
Minneapolis, Minnesota

THE PRODUCTION of regular rythmic cardiac activity at a rate sufficient to maintain adequate blood flow under variable conditions is the function of tissue possessing unique properties.

Heart muscle has the physiologic properties of excitability, contractility, rhythmicity, and conductivity.

Specialized tissues comprised of primitive muscle tissue interspersed with nerve cells and fibers make up a system for the origin and propagation of the heart beat. These specialized tissues comprise the following structures: (1) The sinoauricular node, (2) the atrioventricular node, (3) the atrioventricular bundle, and (4) the branches of the bundle and the Purkinjie system.

The S-A node initiates the beat by starting a wave of depolarization and sets the pace of the heart. The A-V node is a structure lying in the lower part of the interauricular septum, completely separated from the S-A node by atrial musculature. The A-V bundle, or bundle of His, is a well defined bundle of muscular tissue connecting the atrium with the ventricle. This runs forward from the A-V node into the upper part of the septum where it divides into right and left branches, which in turn send branches to the entire ventricular musculature. The A-V node, bundle, and branches serve as pathways to conduct the wave of depolarization rapidly and directionally.

All heart muscle has inherent rhythmicity, and any area can initiate the impulse of contraction. In general, the rate of impulse formation decreases as the ventricle is approached—a factor of great importance in the consideration of complete heart block.

Any factor which can disrupt the functional continuity between the atrium and ventricle wall can produce A-V block. Such block can vary in degree from mere slowing of the wave through the system, termed first degree heart block, progressing to the point where beats are dropped as in second degree heart block, to total failure of A-V conduction or complete heart block.

Failure of the conduction tissues to transmit the excitation wave from the S-A node to the ventricles would result in death if a new pacemaker would not take over the automatic functions. This pacemaker can be in the A-V node, in the bundle of His, or in one of the ventricles (idioventricular rhythm).

Atrioventricular block can be produced by a variety of causes. They are listed as follows:

1. Congenital Lesions.—Imperfect development of the bundle may be associated with interventricular septal defect.
2. Inflammatory or Degenerative Lesion.—Due to rheumatic disease, syphilis, tuberculosis, diphtheria, typhoid fever, and pneumonia.
3. Metastatic Nodules.
4. Areas of Fibrosis.—Most common etiologic factor and results from coronary sclerosis. This may be found in patients with coronary disease.
5. No Visible Lesions.

The clinical response of the patient to chronic heart block depends on the acuteness of its development and the rate of the heart after the block has appeared. If the pacemaker is high in the bundle, the rate may be normal or sufficiently rapid to maintain adequate flow. However, most often chronic heart block is associated with bradycardia. The inherent rate of the idioventricular pacemaker, for example, is usually between twenty and forty beats a minute—sometimes slower. Obviously, below a critical rate the minute volume of blood flow is insufficient to meet the metabolic needs of the cerebral cortex with dramatic consequences, such as the appearance of the familiar Morgagni-Stokes-Adams syndrome.

The primary aim of therapy in chronic heart block is to maintain a rate sufficient to provide adequate minute volume. This problem can be attacked in two ways: Elimination or correction of the process producing the block with restoration of normal rhythm, or should this fail, stimu-

---

Inaugural thesis presented before the Minneapolis Academy of Medicine on April 18, 1955.

lation of the substitute pacemaker to adequately rapid action.

Time-honored therapy of chronic heart block has employed epinephrine or ephedrine. These drugs are effective in increasing ventricular rate. Nathanson found that Isuprel® or Paredrine® are even more effective. Atropine has been the classical companion drug to epinephrine. The basis for its use has been its effect in suppressing vagal tone which is known to impede the transmission across the bundle. Chronic heart block in association with acute posterior wall ischemia is not an uncommon occurrence on a cardiac ward. Aminophylline intravenously is usually effective in restoring normal sinus rhythm—theoretically by increasing blood flow to the septal area. Prinzmetal has made the statement that, after routine drugs prove ineffective, more specialized therapy is required to restore normal rhythm.

Certainly some conditions which produce a structural disruption of the bundle obviously are not correctable. However, in the group of conditions where there is physiologic transient alteration of the tissues of the conduction pathway, treatment may help. Most familiar is the appearance of block in acute rheumatic carditis which usually returns to normal when the active inflammatory process relents.

Prinzmetal reported a case in which chronic heart block with attacks of syncope followed a posterior myocardial infarction. This block persisted for one week with recurrent syncope in spite of increasing doses of ephedrine, Isuprel, and Paredrine. In desperation, 40 mg of ACTH was given. His rationale of treatment was as follows:

"Complete heart block, following myocardial infarction is not always due to permanent and complete destruction of the auriculoventricular node and bundle of His. Instead, these regions may merely be involved by an inflammatory reaction at the edges of the infarct. Under such circumstances, corticotropin or cortisone may suppress the inflammation and thereby abolish the block."

Apparently this occurred in this case because the block disappeared a few hours after ACTH was given—normal sinus rhythm then persisted for several days, then chronic heart block suddenly recurred which could only be controlled by a second dose of corticotropin.

A similar case was observed at the Minneapolis General Hospital. In this instance, however, cortisone was given by intravenous drip on the theory that this was a more direct approach to the problem than use of corticotropin.

A seventy-four-year-old man entered the Minneapolis General Hospital early this year for treatment of an acute exacerbation of chronic bronchiectasis. On parenteral and aerosal antibiotic therapy and general supportive measures, his initial infection and general condition improved gradually. On the fourteenth hospital day he suddenly developed generalized convulsive seizures. His blood pressure was 114/50, pulse 18. He was markedly cyanotic with scythropasmic facies, however, fully conscious. EKG showed complete A-V dissociation. Over the ensuing four hours he was given large amounts of atropine, aminophylline, and ephedrine intravenously. Despite this, the pulse remained at 13/min.

An intravenous drip of 100 mg. hydrocortisone was started. In five hours the pulse was fifty-six per minute and in ten hours sixty-eight per minute. The EKG at this time showed the restitution of normal A-V conduction which was subsequently maintained. The development of leukocytosis, temperature elevations, increased erythrocite sedimenation rate, and high urine urobilinogen, together with EKG changes, led to the conclusion that this man had suffered an acute myocardial infarct in the region of the A-V conduction mechanism which produced acute complete A-V dissociation. This block was refractory to the standardly employed methods of treatment; however, it apparently responded to the IV administration of hydrocortisone. His heart rhythm remained regular during the remainder of his hospital stay and he was subsequently discharged.

What would have happened to this patient without cortisone, no one can say. All of us have seen cases of chronic heart block which returned to normal with no special therapy.

Thorne reports on comparative studies of the electrocardiogram in patients with Addison's disease and Cushing's syndrome. He found that the PR interval tends to be at upper limits of normal or prolonged in adrenal insufficiency, whereas the opposite situation obtains in hypercorticism. He concludes that the mechanisms by which adrenal steroids influence the electrical activity of the heart remains known.

This study is intended to present a concept of therapy of chronic heart block worthy of consideration. Most physicians have known the frustration of trying to treat a patient with refractory complete heart block and would welcome any new approach to therapy. The use of cortisone is universally accepted in the treatment of rheumatic carditis—manifested most frequently by heart block. This is an inflammatory reaction and most

(Continued on Page 814)

Case Presentations

Acute Recurrent Pancreatitis

With a Series of Unusual Complications

MAYNARD C. NELSON, M.D.
Minneapolis, Minnesota

OUR INTEREST in acute pancreatitis and its complications was recently stimulated by an unusual case on the Surgery Service at Minneapolis General Hospital. Portal hypertension with hemorrhage from esophageal varices as a result of acute recurrent pancreatitis has not to our knowledge been previously reported in the literature.

This is the case of a fifty-five-year-old white man, hospital #80109, who was admitted to Minneapolis General Hospital for the first time on August 25, 1954.

A composite picture of his medical history was gained through several sources. This included:

1. Private hospitalization for four days in March, 1953, with a discharge diagnosis of subacute cholecystitis. The leukocyte count was 26,150 per cubic mm. with 95 per cent neutrophils. No amylase determination was done. Urine was positive for sugar.
2. Private hospitalization in August, 1953, for elective cholecystectomy. Pathologic report was "subacute cholecystitis."
3. Private hospitalization from May 27, 1954, to August 5, 1954, for acute abdominal pain, vomiting, and shock. Serum amylase was 1000 activity units. Norepinephrine was required for several days. On July 7, melena and hematemesis were noted. Barium enema was negative. Upper gastrointestinal x-ray study showed narrowing of the antrum but no mucosal changes. The duodenum was normal. Chest x-ray on July 13 revealed atelectasis with fluid at the left base. Two weeks later left upper quadrant tenderness and mass were discovered. Surgical drainage of a "grapefruit-sized mass in the region of the mesocolon, superior to the pancreas and lateral to the stomach" was effected.
4. Coffee-ground emeses on several occasions following discharge in August, 1954, accompanied by confusion and disorientation. During one of these periods he pulled out the drainage tubes from his left upper quadrant wound.

Examination showed a normally developed, fairly well-nourished white man in semi-coma, with a rectal temperature of 38° C, pulse of 120 per minute, respirations 48 per minute, and blood pressure 120/70 mm. of mercury. His skin and mucous membranes were pale. The tongue was red and dry. There were moist rales over both lower lung fields. Bilateral subcostal surgical scars were present, with a sinus in the left scar from which a small amount of purulent drainage exuded. There was no irritation of the skin. Bowel sounds were hypoactive. An ill-defined mass was palpated, extending 10 cm. below the left costal margin. Normal brown stool was present in the rectum. The patient occasionally roused to give slurred, confused responses to questions.

During the examination the patient vomited approximately 2000 cc. of coffee-ground material. Continuous gastric suction yielded 800 cc. of the same material. A unit of whole blood was given rapidly and the patient's clinical appearance improved.

Emergency laboratory data were: Hemoglobin 8.8 grams per cent; hematocrit 29 volumes per cent; leukocytes 16,600 per cubic mm. with 85 per cent neutrophils; urine 4-plus sugar with a specific gravity of 1.027. The blood sugar was 656 mg. per cent, CO_2 combining power 39 mEq/L, chloride 83 mEq/L and serum amylase 434 Somogyi activity units.

Serial blood volume determinations by the Evans-Blue technique were used as a basis for blood replacement, and the patient received 2900 cc. of whole blood in the first twenty-four hours. Five per cent dextrose in distilled water covered by twenty units of regular insulin per liter was given intravenously in addition.

For the first three days after admission to the Minneapolis General Hospital the patient experienced frequent periods of confusion. His temperature ranged from 38.1° C to 39.4° C rectally. Chest x-rays revealed extensive bilateral bronchopneumonia. On August 27, the hemoglobin was 14.2 grams per cent and hematocrit 41 volumes per cent. Serum amylase dropped to seventy-two activity units. On August 29 a large amount of purulent material drained from the abdominal sinus. Coagulase positive *Micrococus pyogenes* (var. *Aureus*), and *Proteus vulgaris* were isolated.

A massive hematemesis of coffee-ground material and fresh red blood occurred on August 30. With this episode, esophageal varices were suspected in spite of the referring physician's statement that peptic ulcer had been demonstrated radiographically. From September 1 to September 9 several lesser hematemesis occurred, requiring repeated transfusions. On September 3 barium study showed esophageal varices and moderate obstruction to the outlet of the stomach. A Sengstaken tube was emplaced and left for three days. Within twelve hours of its removal, bleeding again occurred requiring reinstitution of tamponade.

Laboratory results during this period included a prothrombin time of 21.4 seconds with a control of 13.8 seconds. Bilirubin was 0.15 mg. per cent in one minute and 0.95 mg. per cent total. This rose to 2.0 mg. per

---

Presented as an inaugural thesis before the Minneapolis Academy of Medicine on November 21, 1955.

cent in one minute and 5.3 mg. per cent total on September 9. Cephalin-cholesterol was 2 plus in forty-eight hours, thymol turbidity 16.5 units. The albumin-globulin ratio was 2.90/3.50 grams per cent. Alkaline phosphatase rose from 34.6 King-Armstrong units on September 1 to 78.3 on September 9. Amylase levels remained below fifty activity units.

Another attempt at discontinuation of the Sengstaken tube was followed by more hematemeses. A shunting procedure was then contemplated as a definitive measure. However, it was felt that an attempt at correction of the bilirubin, albumin-globulin levels, and the prothrombin time should precede surgery of this magnitude. Gastric dilatation developed on September 13 and suction returned 1500 cc. of gastric content. Hematemesis of coffee-ground material occurred that evening necessitating replacement of the Sengstaken tube. X-ray study indicated nearly complete pyloric obstruction.

Emergency laparotomy was performed on September 14, disclosing: (1) an indurated mass involving the head and neck of the pancreas and second portion of the duodenum; (2) generalized distention of mesenteric veins (Gastro-epiploic venous pressure was 250 mm. of water measured from the anterior surface of the body of the second lumbar vertebra; the portal vein was normal to palpation); (3) the abdominal sinus extended into the retroperitoneal space in the left upper quadrant but no abscess was detected; (4) the liver was grossly normal; (Liver biopsy was taken—microscopic examination showed no evidence of cholangitis or cirrhosis); (5) antrotomy with intraduodenal digital examination revealed almost complete obstruction of the second portion of the duodenum. Annular pancreas could not be demonstrated. Antecolic gastrojejunostomy was performed. The patient withstood the procedure well and had an excellent postoperative course.

The incision healed without complication. Subjective improvement was dramatic. Liver profile studies showed gradual return to normal levels except for the alkaline phosphatase which remained around 70 to 90 King-Armstrong units for about two months. Ten days after surgery upper gastrointestinal x-ray study demonstrated a well-functioning gastroenterostomy and the esophageal varices were much less prominent. Thirteen days after surgery esophagoscopy revealed "mild esophagitis of the distal esophagus but no visible varices."

The patient's improvement continued until the development of manifest diabetes mellitus three months later. This was satisfactorily controlled with 55 units of NPH insulin daily. Following this he regained his normal weight and resumed his regular employment as a parking-lot attendant.

Discussion

The major complications in this case of acute pancreatitis include: (1) abscess, or pseudocyst, formation; (2) duodenal obstruction; (3) portal hypertension with bleeding esophageal varices; and (4) diabetes mellitus. These complications are not common, but the only one which has not received attention in the literature is the bleeding varices.

The findings in our case strongly support the development of a portal hypertension secondary to acute recurrent pancreatitis, with subsequent hemorrhage from esophageal varices. The evidence favoring this is: (1) the massive upper gastrointestinal hemorrhage which was repeatedly arrested by esophageal tamponade; (2) radiologic demonstration of esophageal varices before surgery; (3) dilated portal bed and elevated portal pressure demonstrated at laparotomy; (4) extreme induration about the head of the pancreas; (5) biopsy of the liver showing no cirrhosis; and (6) the esophageal varices regressed as shown by x-ray and esophagoscopy. No further hemorrhage occurred postoperatively.

No reference to hemorrhage from esophageal varices secondary to acute pancreatitis was found in a review of the literature for the past five years, with some attention also given earlier writings. Paxton[27,28] studied 800 cases of proved acute pancreatitis and found gastrointestinal bleeding from superficial ulcers of the stomach, duodenum, small intestine, and colon. In his experience, acute pancreatitis is fairly common in alcoholics with cirrhosis, but gastrointestinal hemorrhage associated with their attacks was not seen. Doubilet[12] refers to hemorrhage from submucosal varices resulting from localized obstruction of small portal tributaries by dense pancreatic fibrosis. He also attributes hemorrhage to duodenitis and gastritis caused by the adjacent pancreatic inflammatory reaction. Gambill et al,[16] report a case with bleeding from two deep gastric ulcers of the anterior wall, associated with a fatal case of acute pancreatitis. Brown and Smiley[6] had a case of acute pancreatitis secondary to mumps in a sixty-four-year-old man who developed melena and hematomesis. At laparotomy a normal liver and spleen were found; subtotal gastrectomy disclosed patchy shedding of the surface epithelium. Two cases of mesenteric vascular occlusion following pancreatitis are reported.[15,34]

The cause of esophageal varices is usually recorded as elevation of the portal venous pressure or portal hypertension. This may be due to intrahepatic obstruction to the portal blood flow as in the various types of cirrhosis, or to extrahepatic obstruction resulting from thrombosis of the portal vein. Rack et al[29] state that esophageal varices may occur in the absence of disease of the liver or portal system, and with a normal portal venous pressure. Gray and Whitesell[19] feel that in such cases the esophageal varices may at times have a primary origin in the azygos system.

Our case fits into the extrahepatic group in that the portal vein was obstructed outside the liver as a result of acute recurrent pancreatitis. We are of the opinion that the portal hypertension here was due to compression of the portal vein by the surrounding inflammatory process rather than to thrombosis in the portal venous system. This is attested to by a normal portal vein on palpation during laparotomy, and by the rapid disappearance of the esophageal varices with regression of the phlegmonous changes.

References

1. Allbritten, F. F., Jr.: Recurring pancreatitis and associated stenosis of the common bile duct; treatment by Roux-Y choledochojejunostomy. Arch. Surg., 67:779, 1953.
2. Anglem, T. J., and Lee, W. F., Jr.: Acute pancreatitis and its sequelae. Arch. Surg., 58:484, 1949.
3. Baker, J. W., and Durham, M. W.: Associated pancreatic necrosis and biliary disease. Surg., 23: 301, 1948.
4. Barnbrook, D. H.: Impermanent diabetes: A complication of traumatic pancreatitis. Canad. M. A. J., 67:43, 1952.
5. Behrend, M., and Behrend, A.: Chronic pancreatitis causing complete and incomplete obstruction of the common bile duct. Arch. Surg., 57:51, 1948.
6. Brown, M., and Smiley, R. K.: Chronic pancreatitis with steatorrhea following mumps with acute pancreatitis. Am. J. Digest. Dis., 17:280, 1950.
7. Child, C. G., III: The Hepatic Circulation and Portal Hypertension. Philadelphia: W. B. Saunders Company.
8. Coffey, R. J.: The relationship of acute and chronic cholecystitis to acute pancreatitis. South. M. J., 47:448, 1954.
9. Collett, R. W., and Kennedy, R. L. J.: Chronic relapsing pancreatitis associated with hyperlipemia in an eight-year-old boy. Proc. Staff Meet., Mayo Clin., 23:158, 1948.
10. Comess, O. H., and Oymada, A.: Uremia and disseminated platelet-cell (thrombocyte) thrombosis. Arch. Int. Med., 89:802, 1952.
11. Doane, J. C.; Behrend, M.; Solis-Cohen, L.; and Lukens, R. M.: Complete obstruction of the common bile duct due to chronic pancreatitis. Am. J. Digest. Dis., 16:218, 1949.
12. Doubilet: Personal communication.
13. Dreiling, D. A., and Richman, A.: The pancreas and ulcerative colitis: A case of chronic relapsing pancreatitis complicated by ulcerative colitis. Gastroenterol., 17:568, 1951.
14. Edmondson, H. A.; Bullock, W. K.; and Mehl, J. W.: Chronic pancreatitis and lithiasis. I. A clinicopathologic study of 62 cases of chronic pancreatitis. Am. J. Path., 25:1227, 1949.
15. Elkan, W.: Acute mesenteric vascular occlusion following mumps. Internat. Coll. Surgeons, 20:259, 1953.
16. Gambill, E. E.; Baggenstoss, A. H.; Van Patter, W. G.; and Power, M. H.: Pancreatitis; Study of a patient having disseminated fat necrosis, hypocalcemia, hypopotassemia, uremia, diabetes mellitus, ascites and bilateral hydrothorax Gastroenterol., 11:371, 1948.
17. Gardner, C. E., Jr., and Fawcett, B.: Acute pancreatitis with hyperlipemia. Surg., 27:512, 1950.
18. Gatch, W. D., and Brickley, R. A.: Perforation of colon following acute necrosis of pancreas; report of three cases. Arch. Surg., 63:698, 1951.
19. Gray, H. K., and Whitesell, F. B., Jr: Hemorrhage from esophageal varices Ann. Surg., 132:798, 1950.
20. Hurwitz, A., and Gurwitz, J.: Relief of pain in chronic relapsing pancreatitis by unilateral sympathectomy. Arch. Surg., 61:372, 1950.
21. Innerfield, I.; Angrist, A.; and Benjamin, J. W.: Plasma antithrombin patterns in disturbances of the pancreas Gastroenterol., 19:843, 1951.
22. Israels, M. G.: Chronic relapsing pancreatitis with carcinoma of the head of the pancreas. Canad. M. A. J., 68:480, 1953
23. Klatskin, G., and Gordon, M.: Relationship between relapsing pancreatitis and essential hyperlipemia. Am. J. Med., 12:3, 1952.
24. Le Souef, J. D.: Death from uraemia in a case of old hemorrhagic pancreatitis. M. J. Australia, 1:534, 1948.
25. Miln, D. C., and Barclay, T. H. C.: Acute colonic obstruction due to pancreatitis. Lancet, 2:168, 1952.
26. Nabatoff, R. A.: The relationship of pancreatic duct obstruction and dilatation of fat necrosis of the pancreas. J. Mt. Sinai Hosp., 15:139, 1948.
27. Paxton, J. R., and Payne, J. H.: Acute pancreatitis California Med., 72:142, 1950.
28. Paxton, J. R.: Personal communication.
29. Rack, F. J.; Mincks, J. R.; and Simeone, F. A.: Observations on etiology of esophageal varices. Arch. Surg., 65:422, 1952.
30. Richfield, D. F.: Chronic interstitial pancreatitis with diabetes mellitus and terminal necrotizing renal papillitis. Ohio State M. J., 44:59, 1948.
31. Rose, T. F.: Pancreatitis complicated by pseudocyst: Report of a case of a patient dying in diabetic coma. M. J. Australia, 2:854, 1951.
32. Selesnick, S.: Recurrent jaundice in chronic relapsing pancreatitis. Gastroenterol., 21:230, 1952.
33. Shallenberger, P. L., and Kapp. D. F.: Etiologic role of acute pancreatitis in the production of diabetes mellitus Guthrie Clin. Bull., 23:185, 1954.
34. Storer, J.; Kazdan, P.; and Bilton, J. L.: Venous mesenteric thrombosis; Suggested etiology and case report. Am. J. Surg., 84:636, 1952.
35. Vogel, F. S.: Cerebral demyelination and focal visceral lesions in a case of acute hemorrhagic pancreatitis; with a consideration of the possible role of circulating enzymes in the causation of the lesions. Arch. Path., 52:355, 1951.
36. Wainwright, C. W.: Intropancreatic obstruction. New England J. Med., 244:161, 1951.
37. Welborn, M. B.: The surgical management of the sequelae of acute pancreatitis. Indiana State M. A. J., 46:961, 1953.
38. Warren, K. W.; Fallis, L. S.; and Barron, J.: Acute pancreatitis and diabetes. Ann. Surg., 132:1103, 1950.
39. Wilson, R. S.: Anatomical distribution of pancreatic fat necrosis: Report of a case with unusual dissemination. Ohio State M. J., 47:925, 1951.
40. Treatment of pancreatitis along with diabetes (editorial). J.A.M.A., 155:1240, 1954.
41. Case records of the mass. Gen. Hosp.: Case 35202. New England J. Med., 240:815, 1949.
42. Case records of the mass. Gen. Hosp. Case 35051. New England J. Med., 240:189, 1949.
43. Case records of the mass. Gen. Hosp.: Case 35012. New England J. Med., 240:32, 1949.

(Discussion on Page 814)

Extrathyroidal Hypermetabolism Due to a Pheochromocytoma

DONALD A. SCHOLZ, M.D.
LLEWELYN P. HOWELL, M.D.
GRACE M. ROTH, Ph.D.
Rochester, Minnesota

UNCOVERING the cause of hypermetabolism in a patient in whom hyperthyroidism has been excluded may prove to be a difficult problem. Bruger and Hollander[1] recently reviewed the clinical, physiologic and physical factors which may produce extrathyroidal hypermetabolism. For years elevation of the basal metabolic rate has been recognized as a common finding in patients with pheochromocytoma. Not infrequently, however, the clinical picture presented by a patient with pheochromocytoma may be easily confused with hyperthyroidism because of symptoms common to both conditions; namely, nervousness, sweating, tachycardia, increased appetite, loss of weight and intolerance to heat. Our case emphasizes some of the difficulties encountered in the differentiation of these two conditions as well as the precautions which are necessary to procure successful pharmacologic tests for a pheochromocytoma.

Report of Case

A white woman, fifty-three years old, came to the Mayo Clinic in July, 1954, complaining of intolerance to heat and excessive perspiration of about two years' duration. Two sisters and her father had been treated for toxic goiters, and in 1943 the patient had been treated with desiccated thyroid because her basal metabolic rate was —17 per cent. She had discontinued this treatment after several months because tachycardia developed. She also had a lifelong problem of narcolepsy.

In 1953, ten years later, the basal metabolic rate had been determined because of mild intolerance to heat. The rate was reported as +27 per cent, but no further studies of thyroid function were made. Subsequently, while she was on a Mediterranean cruise, perspiration became excessive. This was especially so at night, when sweat would soak "three bath towels." She lost twenty pounds during the two-month period while she was on the trip. She subsequently became aware of a mild tachycardia and would often awaken at night with a pulse rate of more than 100. Her abnormal perspiration and intolerance to heat persisted and during the winter she had slept under only one sheet except to put blankets over her feet and legs which were always cold. She had not noticed protrusion of the eyes, enlargement of the thyroid gland or diarrhea. She gave no history of hypertension or headaches. Her appetite was excellent and she had slowly regained the weight previously lost. Basal metabolic rates of +62 and +65 per cent were found elsewhere in March and April, 1954. At that time use of "medication containing iodine" was begun and continued for several weeks without subjective improvement. She discontinued this medication two months before her examination at the clinic. In the two weeks prior to coming to the clinic she had taken "nerve medicine" which had been prescribed by her physician; shortly after she began this treatment, the sweating became less troublesome.

Physical examination at the clinic revealed a blood pressure of 172 mm. of mercury systolic and 90 mm. diastolic. The radial pulse rate was eighty-four beats per minute, and temperature was normal. The skin was moist but not particularly warm. The neck was beaded with perspiration. There was no tremor of the hands. No exophthalmos, lid lag, or extraocular muscle palsy was present. The thyroid gland was palpable with the right lobe being a little larger than the left. The gland did not seem unusually firm; no nodules were present, and no bruit was audible.

Laboratory studies revealed 12.7 gm. of hemoglobin per 100 cc. of blood, and 4,370,000 of erythrocytes and 9,900 leukocytes per cubic millimeter of blood. The sedimentation rate of erythrocytes was 13 mm. in one hour by the Westergren method, and the value of the fasting blood sugar was 115 mg. per 100 cc. A sulfobromophthalein test of liver function revealed no retention of dye in one hour. The urine was normal. The serologic test was negative for syphilis. Roentgenograms of the chest revealed minimal healed tuberculosis of the right upper lobe. Roentgenograms of the skull revealed slight displacement of the pineal gland to the right. The initial basal metabolic rate was +60 per cent. Another, made after sedation, was +63. Twenty-four hours after administration of a tracer dose of radioactive iodine 9.3 per cent of the dose had accumulated in the thyroid gland, and forty-eight hours

---

Read at the meeting of the Southern Minnesota Medical Association, New Ulm, Minnesota, September 10, 1956.

Drs. Scholz and Howell are from the Section of Medicine, and Dr. Roth is from the Section of Physiology, Mayo Clinic and Mayo Foundation, Rochester, Minnesota.

The Mayo Foundation, Rochester, Minnesota, is a part of the Graduate School of the University of Minnesota.

after administration 75.3 per cent had been excreted in the urine. The value for protein-bound iodine was 2.6 micrograms per 100 cc. of serum. An electroencephalogram revealed minimal nonspecific changes. The slight displacement of the pineal gland to the right was considered by the neurologist to be of no clinical significance.

A diagnosis of hyperthyroidism could not be made on the basis of either clinical findings or laboratory data. The reason for the low uptake of radioactive iodine by the thyroid gland and the subnormal value for protein-bound iodine in the serum could not be explained. The patient denied any medication except the "nerve pills" during the two months previous to these examinations. Exclusion of a pheochromocytoma as the cause for the hypermetabolism was imperative in view of the newly discovered hypertension.

Pharmacologic tests for pheochromocytoma were carried out with the patient lying comfortably on a bed in a constant room temperature of 78° F. The patient was not sweating and was comfortable. The cold pressor test produced a rise in blood pressure from 158/90 to 174/110. A cold pressor test is always carried out before the histamine test since it provides a base line for evaluation of the response to histamine. A histamine test was then carried out by giving 0.05 mg. of histamine base intravenously by means of a tuberculin syringe. The blood pressure which was 150/90 rose to 190/108. Since the increase was only slightly more than that in the cold pressor test, the result was considered to be equivocal. After phentolamine methanesulfonate (Regitine) was given, the fall in blood pressure was likewise equivocal (Fig. 1). A severe headache but no sweating followed the injection of the histamine and the phentolamine. Increased sweating at this time usually indicates the presence of a pheochromocytoma, particularly when the basal metabolic rate is increased. The patient was advised to discontinue all medications and to return in two weeks for repetition of the studies.

When she returned, the resting blood pressure was found to be 156/110. It rose to 184/110 during the cold pressor test. Two minutes after the intravenous injection of 0.05 mg. of histamine base it rose from 156/100 to 204/124. The blood pressure then fell sharply after the injection of phentolamine and the patient began to sweat profusely (Fig. 1). Blood obtained after the injection of histamine at the time when the blood pressure was 204/124 was assayed for pressor amines, that is, for epinephrinelike substances by the chemical method described by Manger and associates.[2] Abnormally high levels of pressor amines were found, and this confirmed the diagnosis of pheochromocytoma.

Surgical exploration was advised and on August 24, 1954, a pheochromocytoma was removed by Dr. Waugh from the left adrenal gland. The tumor measured 2.5 cm. in diameter and weighed 14 gm. The postoperative course was totally uneventful, and the patient no longer was aware of her excessive sweating and intolerance to heat.

In January, 1955, she began to complain of fatigue and intolerance to cold. Her physician found her basal metabolic rate to be —21 per cent and prescribed 1 grain (65 mg.) of desiccated thyroid per day. She returned to the clinic in May, 1955, at which time she appeared euthyroid. Her blood pressure was 110 mm. systolic and 75 mm. diastolic. The basal metabolic rate was —13 per cent, and the value for protein-bound iodine was 3.4 micrograms per 100 cc. of serum. The patient had stopped taking the desiccated thyroid ten days prior to these studies. She returned for a brief checkup in October, 1955, at which time histamine and phentolamine (Regitine) tests were carried out and the response was perfectly normal (Fig. 1). She was dismissed with instructions to continue to take 1 grain of desiccated thyroid per day.

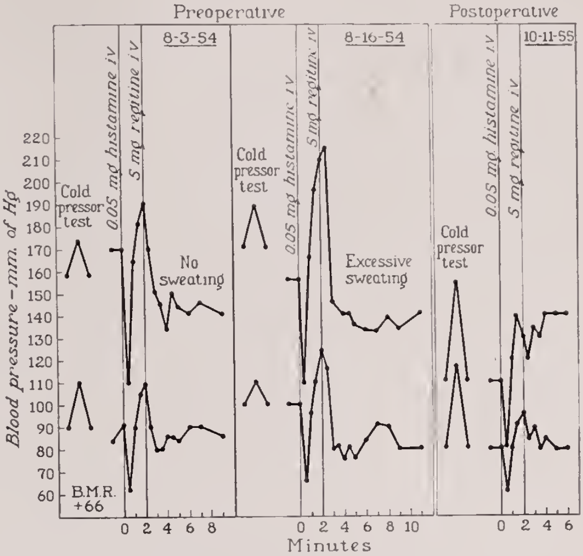


Fig. 1. Changes in blood pressure during the cold pressor, histamine and Regitine tests. *(Left)* The rise in blood pressure during immersion of one hand in cold water at 4° C. for one minute and after the intravenous administration of 0.05 mg. of histamine base in 0.5 cc. of physiologic solution of sodium chloride should be noted. Since the increase after histamine was only slightly more than that in the cold pressor test, the result was considered equivocal. *(Center)* These tests were made two weeks after all medication was stopped. The rise in blood pressure during cold pressor test and the more precipitous rise following the injection of histamine should be noted. At the height of the response to histamine, 5 mg. of Regitine, given intravenously, produced a precipitous fall in blood pressure. These observations indicate a pheochromocytoma. *(Right)* Normal response to histamine and Regitine in the postoperative period.

Comment

Despite the history of intolerance to heat, tachycardia and excessive sweating with elevation of the basal metabolic rate, the patient did not present the usual clinical picture seen in Graves' disease. The thyroid gland was palpable but did not feel significantly enlarged or firm. Except for the elevated basal metabolic rate, laboratory studies of thyroid function were in keeping with the impression that hyperthyroidism was not present. A pheochromocytoma was strongly suspected in view of the symptoms and findings of hypertension and hypermetabolism. The initial histamine and phentolamine (Regitine) tests gave equivocal results. As it was realized that the patient's previous medication might be responsible for a false negative response, she was advised to stop all medication and return for further tests. These later gave unequivocally positive results. Before pharmacologic tests are performed on a patient suspected of having a pheochromocytoma, the use of any sedative or narcotic should be prohibited for forty-eight hours and possible self medication should be checked, as the tests may yield false results if such medication is being used.[3]

In 1923, Boothby and Sandiford[4] demonstrated a prompt elevation of the basal metabolic rate following small subcutaneous doses of epinephrine. Blumgart[5] reported an average increase of 16 percentage points in the basal metabolic rate of normal subjects following the subcutaneous injection of average doses of epinephrine. Bruger and Hollander[1] emphasized that although part of the calorigenic effect might be due to stimulation of the central nervous system with an increase in skeletal tone, careful studies of the *in vitro* effect of epinephrine have demonstrated a role in metabolism at a cellular level. Goldenberg and coworkers[6] were among the first to demonstrate that tumors of the adrenal medulla contained a mixture of epinephrine and norepinephrine in varying proportions with norepinephrine usually predominating. Studies have shown that epinephrine is responsible primarily for the increase in cardiac output, tachycardia and elevation of the basal metabolic rate while norepinephrine, by virtue of its peripheral vasoconstrictive action, causes the elevation of the blood pressure in these patients.[7] In a few cases pheochromocytoma has simulated hyperthyroidism so closely as to lead to unnecessary surgical procedures on the thyroid. McCullagh and Engel[8] have reported the case of a man, twenty-eight years old, whose illness was diagnosed as toxic nodular goiter. Four days after subtotal thyroidectomy, the patient died. Postmortem studies revealed a large pheochromocytoma.

Summary

The case of hypermetabolism due to a pheochromocytoma presented serves to emphasize that some of the clinical symptoms associated with a pheochromocytoma may be mistaken for hyperthyroidism. In cases in which the basal metabolic rate is high but results of other tests of thyroid function exclude the diagnosis of hyperthyroidism, a pheochromocytoma should always be suspected. Some of the precautions necessary to procure successful pharmacologic tests for a pheochromocytoma are discussed.

References

1. Bruger, M., and Hollander, V. P.: Extrathyroidal hypermetabolism: classification and discussion including three illustrative case reports. Ann. Int. Med., 35:1260-1275 (Dec.) 1951.
2. Manager, W. M.; Flock, Eunice V.; Berkson, J.; Bollman, J. L.; Roth, G. M.; Baldes, E. J.; and Jacobs, M.: Chemical quantitation of epinephrine and norepinephrine in thirteen patients with pheochromocytoma. Circulation, 10:641-652 (Nov.) 1954.
3. Roth, G. M., and Kvale, W. F.: Pheochromocytoma, factors in the accurate pharmacologic diagnosis. Dis. of Chest, 29:366-375 (Apr.) 1956.
4. Boothby, W. M., and Sandiford, I.: The calorigenic action of adrenalin chlorid. Am. J. Physiol., 66: 93-123 (Sept.) 1923.
5. Blumgart, H. L.: The Circulatory Response to Epinephrine. In Editorial Committee, Epstein, Albert, Chairman: Contributions to the Medical Sciences in Honor of Dr. Emanuel Libman by His Pupils, Friends and Colleagues. New York: The International Press, 1932, vol. 1, pp. 215-219.
6. Goldenberg, M.; Faber, M.; Alston, E. J.; and Chargaff, E. C.: Evidence for the occurrence of nor-epinephrine in the adrenal medulla. Science, 109:534-535 (May 27) 1949.
7. Goldenberg, M.; Pines, K. L.; Baldwin, E. de F.; Greene, D. G.; and Roh, C. E.: The hemodynamic response of man to nor-epinephrine and epinephrine and its relation to the problem of hypertension. Am. J. Med., 5:792-806 (Dec.) 1948.
8. McCullagh, E. P., and Engel, W. J.: Pheochromocytoma with hypermetabolism: report of 2 cases. Ann. Surg., 116:61-75 (July) 1942.

Season's Greetings

IN wishing you a Merry Christmas this year we would capture for you as much of the old time holiday spirit as possible. Accept our sincere thanks for your generous patronage, which has been a source of real encouragement to us in 1956.

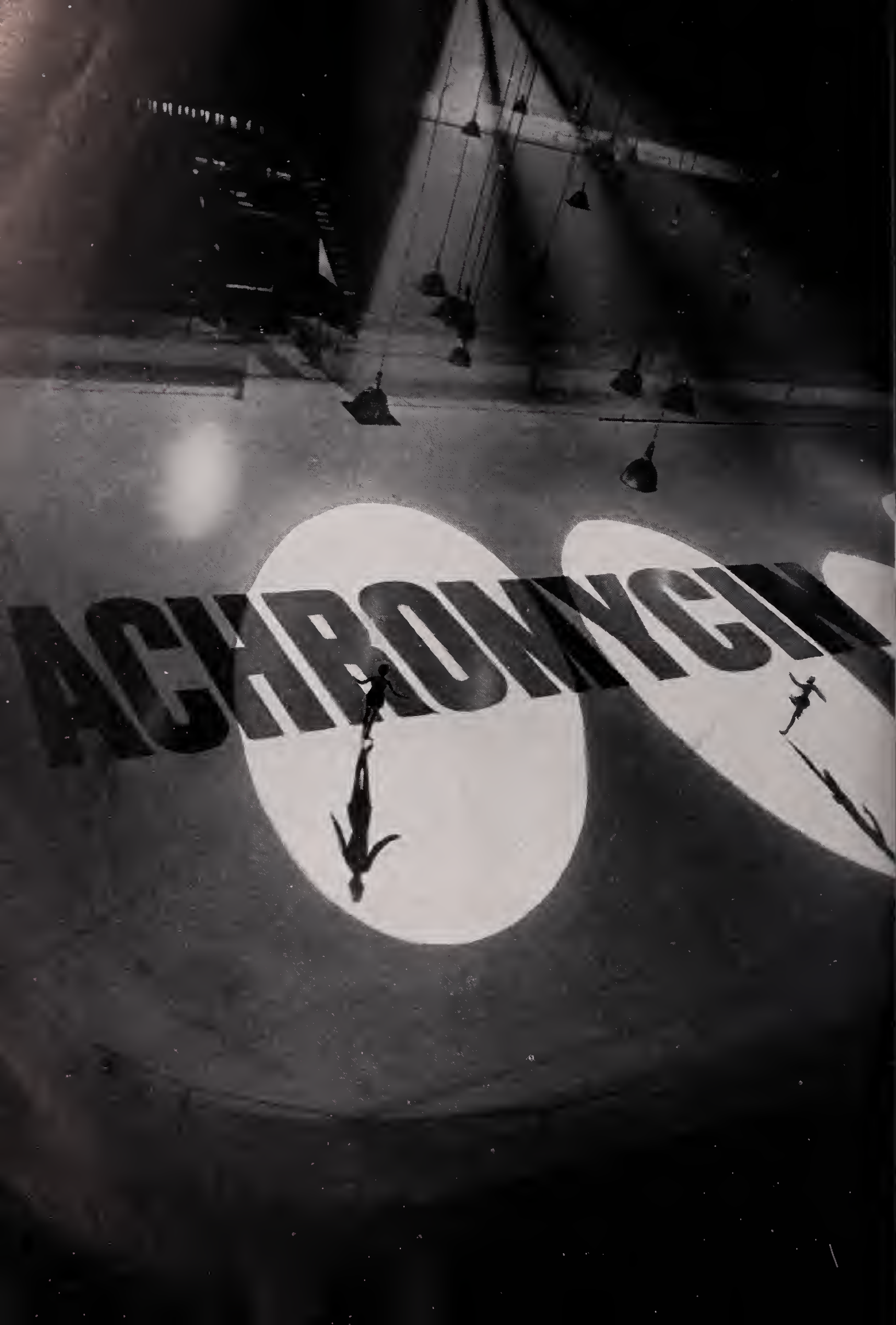
CR
AGENCY
Minneapolis

CASWELL-ROSS AGENCY

1177 N. W. Bank Building
Minneapolis 2, Minnesota
Telephone FE 3-5388

Administrators of Professional Disability Plans

Minnesota State Bar Association
Minnesota State Dental Association
Minnesota Society of C. P. A.
Minnesota State Pharmaceutical Assn.
Minnesota Auto Dealers Association
Minnesota Federation of Eng. Societies
Minnesota State Veterinary Medical Soc.
Hennepin County Medical Society
Hennepin County Bar Association
11th Judicial Bar Association
Minneapolis Association of Life Underwriters
Minnesota State Life Underwriters Assn., Inc.
Ramsey County Medical Society
Ramsey County Bar Association
St. Paul District Dental Soc.
Minneapolis District Dental Soc.
St. Cloud Dental and Stearns County Medical Society
Duluth District Dental Society
East Central Medical Society
St. Louis County Medical Society
West Central Dist. Dental Society
Northwest Proprietors Association
St. Paul Life Underwriters, Inc.


ACHROMYCIN

ACHROMYCIN*

Hydrochloride
Tetracycline HCl *Lederle*

in the treatment of

genitourinary infections

UROLOGISTS report the decided advantages of oral efficacy, minimal side effects, and wide range antibacterial activity offered by ACHROMYCIN in the treatment of urinary tract infections.

Finland's[1] group of patients with acute infections of the urinary tract (principally *E. coli)* demonstrated excellent response, both clinical and bacteriological, following administration of tetracycline.

Prigot and Marmell[2] reported 49 out of 50 patients with gonorrhea showed a negative smear and culture on the first post-treatment visit. Purulent discharge disappeared in these patients within 24 hours after a usual 1.5 Gm. dose of tetracycline.

Trafton and Lind[3] found tetracycline (ACHROMYCIN) an effective antibiotic for treating many urinary tract infections caused by both Gram-negative and Gram-positive organisms.

English, *et al.*[4] noted that a daily dose of 1 to 1.5 Gm. of tetracycline resulted in urinary levels as high as 1 mg. per milliliter.

To suit the needs of your practice and to further the patient's comfort ACHROMYCIN is offered in a complete line of 21 dosage forms.

dry-filled sealed capsules

LEDERLE LABORATORIES DIVISION
AMERICAN CYANAMID COMPANY
PEARL RIVER, NEW YORK

Lederle

*REG. U. S. PAT. OFF.

References:
1. Finland, M., *et al.: J.A.M.A.* 154:561 (Feb. 13) 1954.
2. Prigot, A. and Marmell, M. *Antibiotics and Chemotherapy* 4:1117 (Oct.) 1954.
3. Trafton, H. and Lind, H.: *idem* 4:697 (June) 1954.
4. English, A., *et al.: idem* 4:441 (April) 1954.

Annual Clinical Conference

CHICAGO MEDICAL SOCIETY

March 5, 6, 7 and 8, 1957

Palmer House • Chicago

Daily Half-Hour Lectures by Outstanding Teachers and Speakers on subjects of interest to both general practitioner and specialist

Panels on Timely Topics Daily Teaching Demonstrations

Medical Color Telecasts

Scientific Exhibits worthy of real study and helpful and time-saving Technical Exhibits

The Chicago Medical Society Annual Clinical Conference should be a MUST on the calendar of every physican. Plan now to attend and make your reservation at the Palmer House.

ANNOUNCING

The Twentieth Annual Meeting

of

THE NEW ORLEANS GRADUATE MEDICAL ASSEMBLY

Conference Headquarters—Municipal Auditorium

March 11, 12, 13, 14, 1957

GUEST SPEAKERS

Emery A. Rovenstein, M.D., New York, N. Y.
Anesthesiology

Nelson Paul Anderson, M.D., Los Angeles, Calif.
Dermatology

J. Edward Berk, M.D., Detroit, Mich.
Gastroenterology

Erle Henriksen, M.D., Los Angeles, Calif.
Gynecology

Ovid O. Meyer, M.D., Madison, Wis.
Internal Medicine

Irvine H. Page, M.D., Cleveland, Ohio
Internal Medicine

Barnes Woodhall, M.D., Durham, N. C.
Neurosurgery

John E. Savage, M.D., Baltimore, Md.
Obstetrics

C. Dwight Townes, M.D., Louisville, Ky.
Ophthalmology

Don King, M.D., San Francisco, Calif.
Orthopedic Surgery

Glassell S. Fitz-Hugh, M.D., Charlottesville, Va.
Otolaryngology

Malcolm B. Dockerty, M.D., Rochester, Minn.
Pathology

Sydney S. Gellis, M.D., Boston, Mass.
Pediatrics

Karl Zimmerman, M.D., Pittsburgh, Penna.
Proctology

Laurence L. Robbins, M.D., Boston, Mass.
Radiology

Danely P. Slaughter, M.D., Chicago, Ill.
Surgery

C. Stuart Welch, M.D., Albany, N. Y.
Surgery

William L. Valk, M.D., Kansas City, Kans.
Urology

Lectures, symposia, clinicopathologic conferences, round-table luncheons, medical motion pictures, scientific exhibits and technical exhibits.

(All-inclusive registration fee—$20.00)

THE POSTCLINICAL TOUR TO THE MEDITERRANEAN AND EUROPE

Leaving March 16, 1957, from New York

For information concerning the Assembly meeting and the tour write Secretary, Room 103, 1430 Tulane Avenue, New Orleans 12, La.

Traumatic Diaphragmatic Hernia with Strangulation and Gangrene of the Stomach

DANIEL J. MOOS, M.D.
Minneapolis, Minnesota

STRANGULATION of a diaphragmatic hernia has been reported approximately seventy-seven times. Of this group, eight cases of strangulation of the stomach with gangrene have been described. Hurley[6] points out that up to 1951 he has been able to find only two such instances attended by recovery, including his own. Sheridan[8] in 1955 added another which, together with the following report, raises the total to four.

The mortality following gastrointestinal obstruction in any diaphragmatic hernia has been high; Hedbloom[5] in 1925 reported a mortality of 53.1 per cent. Thirty-nine cases collected by Carter,[1] in which strangulation had occurred, exhibited a mortality in the years 1798 to 1919 of 88.8 per cent and of 57 per cent from 1920 to 1945. He also found that 90 per cent of strangulated diaphragmatic hernias occurred in the traumatic variety. These facts serve to remind us that in this hernia, as in any other, danger exists for the owner.

In spite of the paucity of reports concerning gastrointestinal strangulation in diaphragmatic hernias, it is likely that the true incidence of this condition is increasing in number commensurate with the appalling increase during the last two decades of violent injury due to automobile accidents. Upon reviewing reports of others who have had to deal with these injuries one is impressed by the oft repeated delay or failure in diagnosis which rapidly leads to the death of the individual involved. The characteristic history, signs and symptoms viewed in retrospect make an impression not easily forgotten. If one is aware of these typical findings, diagnosis will be prompt and the necesary life-saving operation will not be delayed.

One may safely state that when an individual with a history of recent or remote injury to the trunk develops severe upper abdominal or chest pain with or without signs of intestinal obstruction, the possibility of strangulation of a diaphragmatic hernia is present. If, in addition, dullness or tympany with absence of breath sounds in the left chest and displacement of the heart to the right is noted, the diagnosis must be strongly considered. When x-ray examination of the chest reveals a high diaphragm with or without large gas bubbles in the pleural cavity one may assume with much certainty that herniation of a hollow viscus through the diaphragm has occurred. It should not be necessary to confirm the diagnosis by allowing bloody fluid to accumulate in the pleural cavity (to be identified by thoracentesis) or to wait until distention of the displaced viscera shifts the mediastinum to an extent incompatible with normal cardiorespiratory function. The presence of shock associated with a gangrenous visceral wall and its attendant hemoconcentration, decreased renal function and azotemia are harbingers of a soon to be irreversible state. They, too, should not be awaited as confirmatory evidence of strangulation in this instance, any more than in a strangulated external hernia of common variety. Early surgical release of the constricting ring is mandatory and must be carried out regardless of the patient's general condition; for untreated, the outlook of such cases is hopeless.

The following case report with its characteristic roentgenographic findings illustrates the natural history of this condition.

Case Report

Mrs. M. S., age fifty-five, was admitted to the Minneapolis General Hospital, September 11, 1948, at 2:36 a.m., approximately one hour after being injured in an automobile accident. Interrogation of the patient yielded little specific information other than complaints of being confused, dazed and "hurt all over." It was noted that periorbital subcutaneous hemorrhages were prominent. Blood was oozing from the left ear; several extensive scalp lacerations were present, and marked tenderness was present over the posterolateral aspect of the left chest.

Detailed physical examination of the chest was not performed at this time. Her respirations were shallow, obviously painful and from eighteen to twenty per minute. The blood pressure was 130 millimeters of mer-

---

Presented as an inaugural thesis before the Minneapolis Academy of Medicine on December 19, 1955.

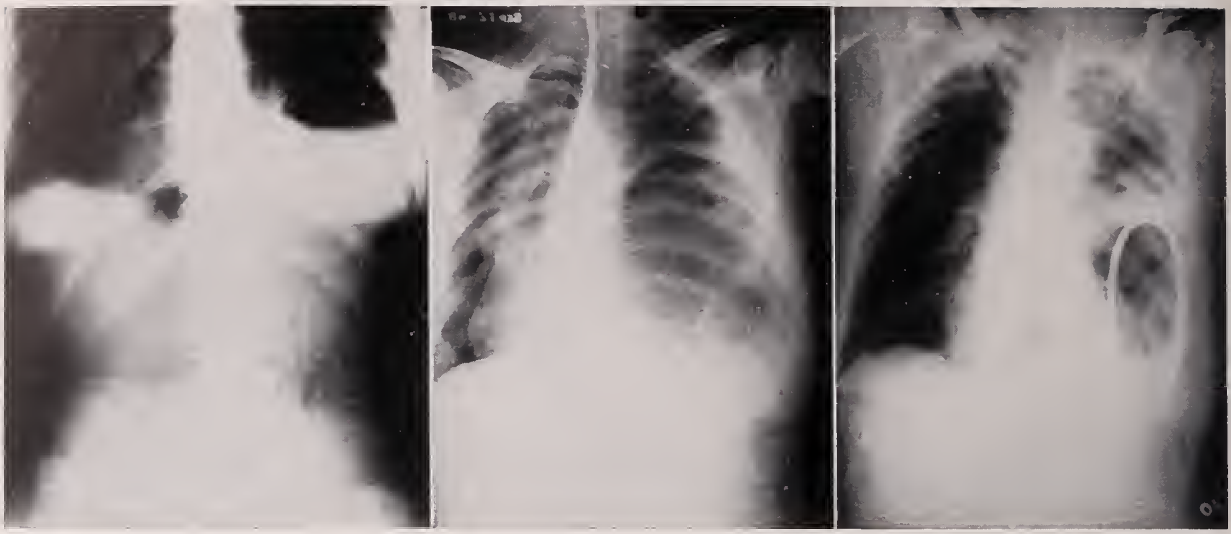


Fig. 1. (*left*) Abdominal roentgenogram at time of admission. Fig. 2 (*center*) Roentgenogram of the chest, thirty-nine hours after admission, demonstrating enormous dilatation of the intrathoracic stomach and displacement of the heart to the right. The Levine tube does not enter the stomach. Fig. 3. (*right*) Appearance after aspiration of the stomach through thoracic wall. The cardiac shadow is more nearly in its proper position and the Levine tube has entered the stomach.

cury systolic and 80 millimeters of mercury diastolic. The pulse was strong at ninety-six beats per minute. Her abdomen was soft and not tender. Little of note was found in the remainder of the examination. A hemoglobin determination, done soon after entrance to the hospital, was 78 per cent of normal, with a white blood cell count of 10,500 cells per cubic millimeter and a hematocrit reading of 33 per cent. Urinalysis indicated one plus albumin with fifteen to twenty red blood cells per high power microscopic field. X-ray examination of the chest on admission revealed a high left diaphragm with a fluid level and gas bubble which during the early morning examination were not thought to be within the chest (Fig. 1). X-ray examination of the pelvis was normal. The scalp lacerations were cleansed and closed by suture. Many abrasions were cleansed and dressed. At 4:00 p.m. that day the hemoglobin level was found to be 68 per cent and the hematocrit level 34 per cent. The blood pressure remained at 130 millimeters of mercury systolic and the pulse rate varied between 90 to 100 beats per minute. Her condition appeared stable and no further specific therapy appeared necessary for the present. This state of affairs continued until 11:30 p.m., September 12, 1948 (thirty-nine hours after admission) when the patient developed sudden severe pain in the upper abdomen and left chest. This pain was described as precordial in character. The patient's blood pressure dropped to 90 millimeters of mercury, systolic, and 60 millimeters of mercury, diastolic, for 10 to 15 minutes, with a sharp increase of the pulse rate to 120 beats per minute. A concurrent electrocardiogram was normal. Her blood pressure soon rose to 130 millimeters of mercury systolic and 80 millimeters of mercury diastolic and the chest pain subsided. One hour later a dramatic change occurred. The patient became cyanotic, cold and clammy. The blood pressure fell to 70 millimeters of mercury systolic and 20 millimeters of mercury diastolic and it was now noted that no breath sounds were audible over the lower two-thirds of the left chest and that the percussion note was the same (resonant) on both sides. Plasma and whole blood (1500 cubic centimeters) were administered and another x-ray examination of the chest was made (Fig. 2). Enormous dilatation of a hollow viscus thought to be the stomach was noted, and on comparison with the earlier films a tentative diagnosis of traumatic diaphragmatic hernia was made. The patient did not vomit and her abdomen remained normal to examination. Bronchoscopy demonstrated compression of the left bronchus. A Levine tube inserted into the esophagus (Fig. 3) could not be passed into the stomach. The patient's condition deteriorated rapidly. The blood pressure became imperceptible and death appeared imminent. Therefore, a 20-gauge aspirating needle was thrust into the left chest removing readily 850 cubic centimeters of dark liquid which was positive for Hcl to Topfer's reagent. The gastric tube now passed into the stomach and 2500 cubic centimeters of fluid contents in addition to an unknown amount of air was rapidly removed. Following these maneuvers, immediate improvement was noted in the patient. Her blood pressure rose to 112 millimeters of mercury systolic and 80 millimeters of mercury diastolic, breath sounds returned to the left chest and the heart, which had previously shifted to the right, returned to a more normal position. The cyanosis disappeared. X-ray examination (Fig. 3) now dispelled any doubt of what had occurred. The opaque gastric tube was seen coiled in the stomach, which unquestionably lay in the chest. The pressure gradient between the intrapleural space and atmospheric pressure allowed swallowed air to enter the stomach easily causing dilatation of that organ until it behaved precisely in the manner of a tension pneumothorax collapsing the entire left lung and shifting the mediastinum to such a degree that alarming cardiorespiratory symptoms ensued.

The hemoglobin determination was now 58 per cent with a hematocrit of 30 per cent. The situation from a clinical standpoint appeared well controlled and in view of the associated injuries (fractures of the left fourth, fifth and sixth ribs and a basal skull fracture, in addition to many lacerations and contusions) continuation of conservative therapy appeared indicated. However, on the following day (forty-seven hours after admission) cardiorespiratory collapse again occurred. Thoracentesis and manipulation of the gastric tube failed to improve the situation. The patient had manifest oliguria (75 cubic centimeters of urine preceding twenty-four hours) and her blood pressure remained at shock level (80 millimeters of mercury systolic and 60 millimeters of mercury diastolic) with a rapid thready pulse in spite of continuous administration of whole blood.

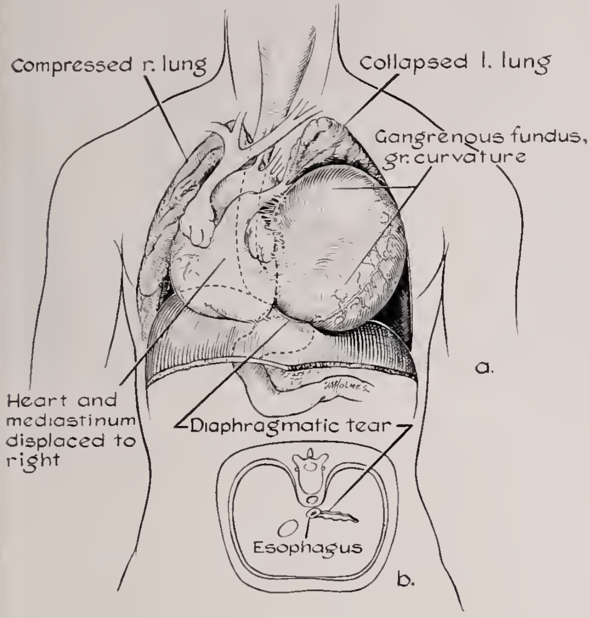

Compressed r. lung
Collapsed l. lung
Gangrenous fundus, gr. curvature
a.
Heart and mediastinum displaced to right
Diaphragmatic tear
Esophagus
b.

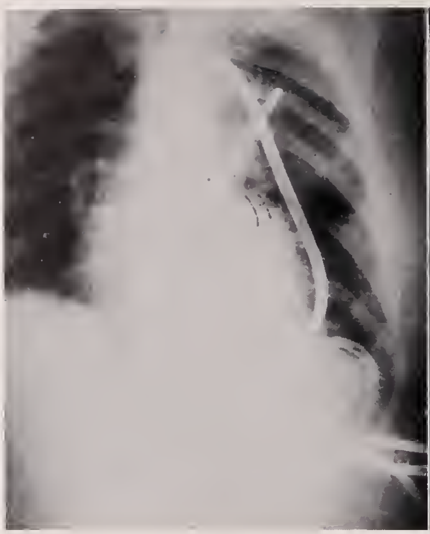
Fig. 4. Strangulated, traumatic diaphragmatic hernia with gangrene of the fundus and greater curvature of the stomach.

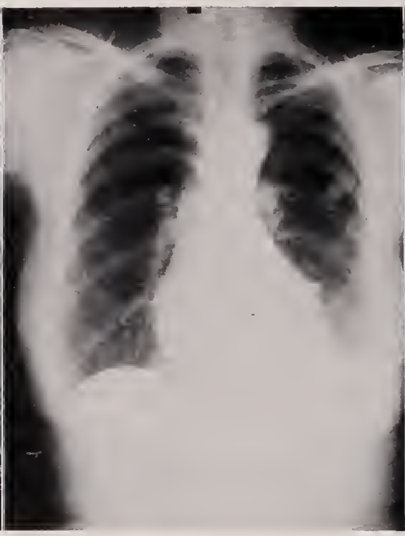
Immediate thoracotomy was advised despite her precarious state. It is of interest to note that when she arrived in the operating room the anesthetist was reluctant to anesthetize the patient and insert an intratracheal tube. This was accomplished, nevertheless, and the left thorax entered through the bed of the eighth rib. The left lung was almost completely collapsed. Bloody fluid (perhaps 800 cubic centimeters) was present in the pleural cavity. The stomach was intrathoracic, about 70 per cent of it being coal black in color. It was attached lightly to the lung, mediastinum and adjacent pleura by soft fibrinous adhesions. Rapid decompression of the dilated stomach was immediately effected and the anesthetist asked to inflate the atelectatic left lung. Coincident with these procedures the blood pressure rose to normal, 130 millimeters of mercury systolic and 80 millimeters of mercury diastolic, the pulse became slower (from 160 to 110 beats per minute) and cyanosis disappeared. A fresh tear in the left diaphragm extending from the esophageal hiatus towards the dome, for about three inches, was seen. This aperture formed a tight ring about the stomach, from cardia to antrum, strangulating 70 per cent of the stomach (Fig. 4). So tight was the constriction that incision of the diaphragm to enlarge the rent was necessary in order to free the stomach. Following this procedure, some improvement in circulation to the lesser curvature aspect of the stomach was seen. The fundus and two-thirds of the greater curvature remained black and obviously gangrenous. This area was excised until bleeding tissue was encountered. It was then noted that all of the remaining gastric mucosa appeared necrotic. Total gastrectomy was considered. However, in view of the gravity of this individual's condition and because the seromuscular portion of the gastric remnant appeared viable, the remainder of the stomach was closed in two layers using a running stitch of catgut through all layers over which inverting interrupted seromuscular stitches of fine silk were placed and tied. The portion of the stomach remaining resembled a tube only slightly larger than the esophagus. It was placed in the abdomen and the diaphragmatic rent was closed (direct apposition of the torn edges) with a running catgut stitch supplemented by interrupted sutures of 3-0 silk. The phrenic nerve was crushed. The pleural cavity was cleansed with saline, 0.5 gram of streptomycin and 500,000 units of penicillin were placed in it, and the chest wall closed after two intercostal catheters were placed for continuous negative pressure drainage.

Postoperatively, penicillin and streptomycin were continued in appropriate dosage. The oliguria, which was most severe on September 13, gradually disappeared. The urine output was 135 cubic centimeters on September 14, 630 cubic centimeters on September 15, 1000 cubic centimeters on September 16, and 1650 cubic centimeters on September 17. These changes were mirrored by a blood urea nitrogen determination of 111 milligrams per cent on September 15, which fell to normal during the next week as renal function improved. Hemoconcentration as evidenced by a peripheral hemoglobin determination of 122 per cent with a hematocrit level of 52 per cent on September 14 rather rapidly receded to normal during the next week. This extra renal azotemia occurred in the absence of vomiting and in the presence of an adequate fluid intake.

The carbon dioxide combining power of the blood expressed in volume percentage was eighty-one on September 14, seventy-four on September 15, seventy-six on September 16, seventy-two on September 17, and sixty-three on September 19. On the same days blood chloride values in milligrams per cent were 580, 580, 580, 628 and 620, respectively.

X-ray examination of the chest following closure of the operative wound (Fig. 5) indicated that the left lung had expanded and that the diaphragm was in normal position. On the fourth postoperative day the intrathoracic catheters were removed together with the





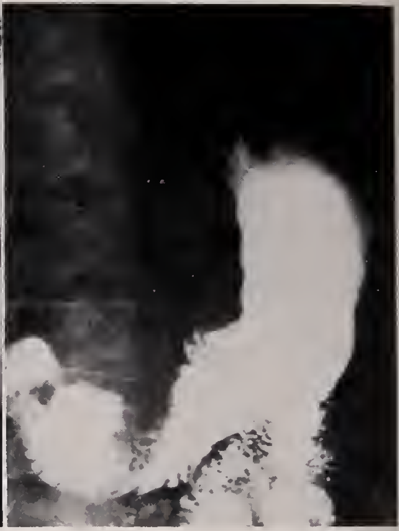


Fig. 5. (*left*) Roentgenogram made immediately after surgery. The cardiac shadow is in normal position and the left lung has expanded. Fig. 6. *(center)* Roentgenogram of chest on March 1, 1950. Pleural thickening and obliteration of costophrenic angle are the only residual changes. Fig. 7. (*right*) Roentgenographic appearance of the barium filled stomach, March 1, 1950.

gastric tube. Gradual resumption of oral feedings began, which were well tolerated.

X-ray examination of the chest on March 1, 1950 (Fig. 6), with the exception of obliteration of the costophrenic angle and pleural thickening, was relatively normal. Roentgenograms of the barium filled stomach (Fig. 7) on the same date show a somewhat shortened stomach which is narrow but of surprisingly good capacity, lying beneath a well demarcated diaphragm. The patient was last examined in November 1955 and had no complaints relative to this injury.

Discussion

There are many interesting features of this case. Undoubtedly the first sudden chest pain, thirty-nine hours after injury, indicated that strangulation had begun. At this time a favorable and safe moment existed for thoracotomy and release of the hernia. It is apparent that all the evidence necessary for diagnosis was at hand. Even when the Levine tube passed into the stomach after that structure had been deflated with an aspirating needle through the thorax, serious consideration of gangrenous change in the stomach was not entertained. Only after cardiorespiratory and renal function had become profoundly depressed and not responsive to other therapeutic endeavors did the absolute necessity for surgical intervention become apparent.

It seems that a relatively simple train of thought will prevent this in the future. First, one must think of a diaphragmatic hernia in any individual who has had a penetrating or blunt injury to the trunk. If that person has sudden abdominal or thoracic pain associated with physical and x-ray evidence of a high diaphragm on the left, the diagnosis can be easily and rapidly confirmed. Then, with the knowledge that these hernias, like others, can be associated with gangrenous changes, conservative therapy can be immediately discontinued and the hernia surgically released and repaired with every prospect of a good result. The resection of bowel or stomach as an emergency procedure should then rarely be necessary.

The rather remarkable regenerative power of the stomach is apparent. In spite of a badly damaged gastric remnant with a gangrenous necrotic mucosa, an adequate stomach was demonstrable two years later. It is well to be conservative in resection of this organ under such circumstances, and wherever some blood supply still exists the probability of permanent viability is good.

Most diaphragmatic hernias are best approached through thoracic or thoracoabdominal incisions. It would seem reasonable, however, in poor risk patients to avoid transsecting the costal margin and to use two separate incisions, if necessary. It is well to keep in mind that if only an abdominal incision is used, the open diaphragm after reduction of the hernia necessitates control of respiration by the anesthetist in the same manner that is required when the chest is open.

Summary

An individual presenting a history of injury to the left chest was found to have a strangulated diaphragmatic hernia in which the stomach had become partially gangrenous. Surgical release of the hernia, partial resection of the stomach and repair of the diaphragm was followed by recovery. Pathognomonic signs and symptoms were present which include:

1. History of injury to the trunk.

2. Sudden severe left thoracoabdominal pain.

3. Absent breath sounds in the left chest with resonance to percussion. (Dullness may be noted if stomach is filled with fluid).

4. Cardiac displacement to the right.

5. Absence of abdominal findings (noted when stomach only is involved).

6. X-ray evidence of diaphragmatic hernia.

Conclusion

Strangulated diaphragmatic hernias can be readily identified. As in strangulated hernias elsewhere, early surgical release is indicated. The probability of this lesion existing is increasing and must always be consdered when one evaluates the effect of injury upon the individual.

References

1. Carter, B. N., and Guiseffi, J.: Strangulated diaphragmatic hernia. Ann. Surg., 128:210, 1948.
2. Cooper, Astley: Phrenic Hernia, in Treatise on Hernia, London, 1824.
3. Gibson, F. S.: Diagnosis of diaphragmatic hernia with acute obstruction. J.A.M.A., 85:947-953, 1925.
4. Harrington, S. W.: Various types of diaphragmatic hernia treated surgically, report of 430 cases. Surg. Gynec. & Obst., 86:735-755, 1948.
5. Hedbloom, C. A.: Diaphragmatic hernia. J.A.M.A., 85:947-953, 1925.
6. Hurley, G. A. P.: Strangulated hiatus hernia. Ann. Surg., 138:262, 1953.
7. Reid, J.: Case of diaphragmatic hernia produced by a penetrating wound. Edinborough M. J., 53:104-112, 1840 (cited Ambrose Pare report in 1564, Strangulation).
8. Sheridan, J. T.: Incarcerated diaphragmatic hernia with gangrene of the stomach. Surgery, 38:741, 1955.

FAT EMBOLISM

(Continued from Page 777)

17. Harman, J. W., and Ragaz, F. J.: The pathogenesis of experimental fat embolism. Am. J. Path., 26:551, 1950.
18. Monson and Dennis: Quoted by Peltier.[5]
19. Levy, L. J.: Fat embolism. Am. J. Surg., 7:637, 1952.
20. Berkheiser, S. W., and Giffen, H. K.: Bone marrow and fat embolism following multiple fractures. J.A.M.A., 147:564, 1951.
21. Rappaport, Raum and Harrell: Bone marrow embolism. Am. J. Path., 24:407, 1951.
22. Wyatt, J. P., and Kohoo, P.: Fat embolism in trauma. Am. J. Clin. Path., 20:637, 1950.
23. Monson, E. M.: Diagnosis and treatment of fat embolism. Thesis, University of Minnesota, June, 1951.
24. Dunphy, J. E., and Ilfield, F. W.: Fat embolism. Am. J. Surg., 77:737, 1949.
25. Kolmert, F.: A few observations on fat embolism. Acta Med. Scandinav., 83:263, 1939-40.
26. Ryerson, E. W.: Fat embolism in bone surgery: Incidence and prevention. J.A.M.A., 67:657, 1916.

THE RETURN OF MASTOID SURGERY

(Continued from Page 780)

4. More malignant disease of the ear.

5. Improvement in correction of bilateral congenital auditory atresias.

6. Increased interest in the fenestration operation.

7. Labyrinthotomy for incapacitating disease of the vestibular labyrinth.

References

1. Lempert, J.: Lempert endaural subcortical mastoidotympanectomy for the cure of chronic persistent suppurative otitis media. Arch. Otolaryng., 49:20-35 (Jan.) 1949.
2. Pattee, G.: An operation to improve hearing in cases of congenital atresia of the external auditory meatus. Arch. Otolaryng., 45:568-580 (May) 1947.
3. Woodman, D.: Congenital atresia of the auditory canal: Two-stage operation with fenestration. Arch. Otolaryng., 55:172-181 (Feb.) 1952.

Seminar

Metabolism of Melanin Pigment

ROBERT J. McCOLLISTER, M.D.
Minneapolis, Minnesota

THE COLOR of human skin is an attribute which is important (1) in the clinical estimation of the general health of the individual, (2) at times as an indicator of internal illness, (3) as a component of various dermatologic diseases, (4) in prognosis of future illness, and (5) as one factor in determining social status in modern man. Skin color has been studied and analyzed by Edwards and Duntley.[8] According to these authors, all races owe their characteristic color only to variation in amounts of melanin and melanoid; the term "redskins" as applied to the American Indian refers to exogenous paint application and not to endogenous pigmentary characteristics. They found that the color of the skin is determined by the mixture and preponderance of the following five components: (1) melanin (yellow to black), (2) melanoid (pure yellow), (3) carotene (yellow), (4) oxyhemoglobin (red), and (5) carboxyhemoglobin (blue).

The purposes of this paper are to discuss both the physiology of melanin pigmentation and distribution patterns of the pigment in a number of diseases.

Physiology

Melanin is an organic pigment varying in color from yellow to black depending on concentration. It occurs throughout the animal kingdom, from unicellular organisms to mammals. It has been studied for many years, but the chemical composition and the exact mode of synthesis are unknown. In man, melanin is found in the body skin and hair and uveal tract (choroid and iris). Dendritic cells called melanocytes, located at the basal layer of the epidermis, are the cellular site of production of the coloration and are found throughout the integument. In a recent study, Szabo[19] found that they were in highest concentration in the nipples, anogenital area, ears, cheeks, forehead and posterior cervical areas, with lesser numbers in the arms and thighs. A rough correlation can be made between these areas and sites of predilection for most intense melanosis. Decreasing amounts of pigment granules are found scattered in all epidermal layers including stratum corneum, the most superficial layer. Small amounts are found in dermal phagocytic cells called chromatophores.

Tyrosine is an amino acid found in many dietary proteins. In man it is derived from exogenous protein sources as well as from conversion of phenylalanine in the body. It is metabolized to important compounds at three sites[7]: in the thyroid it is iodinated to form thyroxine, in the adrenal medulla it is converted to epinephrine, and in the melanocytes tyrosine is oxidized to melanin. Under the influence of tyrosinase, a copper-containing enzyme demonstrated in man in 1950,[13] and oxygen, tyrosine is rapidly converted to dihydroxyphenylalanine (DOPA). This compound is further oxidized through various indole and ortho-quinone substances, and the products are polymerized to melanin itself. Cells which react to form pigment after immersion in a solution of dihydroxyphenylalanine, so-called DOPA positive cells, are thought to be the site of the enzymatic tyrosine oxidation reaction. Histologically, these cells are the melanocytes, the basal dendritic cells. Other cells which are DOPA negative are noted to contain melanin; these are not production sites but represent sites of stored or excreted pigment. These are found both in dermis (chromatophores) and in epidermis (palisade cells). This enzymatic reaction which converts tyrosine to melanin is influenced by physical, chemical and hormonal factors, many of which are of clinical importance.

1. *The Influence of Physical Factors.*—The physical traumata of heat, ultraviolet light, gamma radiation and mechanical irritation of the integument accelerate melanin production. Thus, one sees the characteristic brown reticular pattern

---

Given as a medical grand rounds paper, Veterans Administration Hospital, October 21, 1955.

of the hot water bottle burn (melanosis calorica), the tanning effect of sun, melanosis after x-ray therapy, and the scattered darkening in pruritus-producing diseases.

2. *The Influence of Chemical Factors.*—(1) Substances that combine with copper tend to produce depigmentation. It is noted that tyrosinase is of paramount importance and that it is linked with or actually contains copper. Removal of copper, or binding it with other substances, could be expected to lead to inhibited pigmentation. Such is the case with organic sulfhydryl containing compounds such as thiouracil, cysteine and BAL. Their effects have been incompletely studied *in vivo;* in one case report where thiouracil was given to a patient with melanuria, the urine changed from black to normal color. Interference with copper metabolism can also be produced in some as yet unknown manner[1] by grazing cattle on grass with high molybdenum content. One end result of this is depigmentation, correctable by administration of copper sulfate. Conversely, lack of sulfhydryl groups in the skin occurs in starvation because of protein lack and presumably leads to imbalance in the normal copper-sulfhydryl equilibrium. Starvation or war melanosis has been noted clinically. (2) Reducing substances, such as ascorbic acid tend to prevent melanin formation by reduction of the orthoquinone intermediate substances. Large doses of Vitamin C have been reported[13] to decrease the pigmentation in patients with Addison's disease. Phenyluria has been produced in infants by feeding large amounts of tyrosine and phenylalanine, leading to the excretion of intermediary breakdown products. Administration of vitamin C counteracts the phenyluria.[7] (3). Substances, such as hydroquinone, which act in an unknown fashion, perhaps as tyrosinase inhibitors, may produce depigmentation. Occupational leukoderma has been seen in workers wearing rubber gloves, hydroquinones having been used as antioxidants in the rubber processing.

3. *The Influence of Hormonal Factors.*—Much recent work has been done concerning hormonal regulation of melanosis,[14,15,17,18] especially with regard to melanocyte stimulating hormone (MSH). This hormone, called intermedin because of its probable site of origin in the intermediate lobe of the pituitary, exerts an undefined overall regulation of melanin production. It acts, perhaps directly, on the melanocyte, but is governed always by inhibitory influences of adrenal corticoids. Some interesting, rather unrelated clinical observations, enumerated by Lerner et al,[15] point to the pituitary as a site of pigmentary control:

(1) During pregnancy skin darkening occurs and new nevi form. It is known that the pituitary hypertrophies during pregnancy.
(2) Malignant melanomas grow more rapidly in pregnancy.
(3) Children are noted to have more nevi after infections and other stresses.
(4) The washed-out depigmentation of patients with hypopituitarism is striking.

It has also been shown[15] that:

(1) Cortisone and hydrocortisone decrease the pigmentation of patients with Addison's disease and will prevent melanosis if given early.
(2) In patients with Addison's disease in whom the medulla as well as the cortex is destroyed, more pigmentation is noted than when the medulla is intact.
(3) MSH activity is increased in the blood and urine in Addison's disease and during pregnancy.
(4) An intact pituitary is essential for the formation of pigmentation in Addison's disease, an important clinical point in differentiating primary and secondary hypofunction of adrenal cortex.
(5) MSH given to human beings leads to diffuse melanosis.

Clinical Aspects

Conditions associated with melanosis are legion, and relatively complete lists which classify the conditions are long.[4] However, the vast majority of these conditions are not dermatologically diagnostic[5] as one inspects the pigmentary changes. We may consider, however, a few selected instances where darkening of the skin may be sufficiently characteristic to be of specific help in diagnosis:

1. *Peutz-Jeghers syndrome* was probably first described by Sir Jonothan Hutchinson in 1896, later described by Peutz in 1921, and amplified by Jeghers.[10] Patients with this syndrome have poly-

posis of the small intestine associated with numerous bluish or brownish black pigmented macules of the lips, circumoral area, oral mucous membranes and digits. These macules are from 1 to 5 mm. in diameter, usually darker than freckles and have no tendency to coalesce. The relationship of this disease to melanosis coli, where heavy melanin deposits are present in the colon of darkly pigmented chronically constipated patients who ingest cascara frequently, is unknown.

2. *Hemochomatosis.* Here, excessive iron deposits in liver and pancreas lead to cirrhosis and diabetes, and associated increased iron and/or melanin in the skin give rise to characteristic bronzing or slate greying. Melanin is thought to be often the earlier type of pigmentation, is located of course in the deepest layers of the epidermis, and alone causes its usual brownish color. Hemosiderin is found in the corium and alone is responsible for a slate or bluish black hue. When combined, these two give rise to the classic bronze color.

3. *Acanthosis nigricans* can be diagnosed histologically. It is a dermatologic disorder often found initially in the axillae, but also on the neck, on various flexor surfaces, and in the anogenital areas. The skin is diffusely raised, velvety, and verrucous-like, colored brownish black with accentuated skin lines visible. It is associated with abdominal neoplasm in about 50 per cent of cases. One perhaps not-so-old saw states, "Acanthosis nigricans occurring in an adult is an indication for an exploratory abdominal operation." A juvenile or benign type may occur prior to the age of twenty and often is associated with endocrine disturbances.

4. *Von Recklinghausen's disease* or neurofibromatosis is associated with cafe-au-lait spots (these are usually not congenital, but develop in childhood) and also large areas of brown skin pigmentation. Palpable neurofibromata suggest the diagnosis, but in the occult or "formes frustes" type, the smooth bordered, oval, uniformly light brown macules (measuring about 1.5 to 3 cm. in diameter) may be the only visible findings. It has been stated that a patient with six or more typical cafe-au-lait spots as noted above should be considered as having neurofibromatosis until proved otherwise.[6]

5. *Ochronosis,* another quite rare entity, is included because of the tell-tale blue color of ears, nose, knuckles, and the dark brown-blue of the skin. The pigment which produces the color is a polymerized product of homogentisic acid and is chemically identical with, or very similar to, melanin; it is deposited in the tissues because these individuals lack homogentisinase and are unable to split the ring of homogentisic acid, it then accumulates and is oxidized in the tissues. Interestingly, since the pigment is located below the epidermis, reflected light from the pigment granules scatters in the stratum mucosum, leading to the production of a greater proportion of short (blue) wave lengths. (This situation is analogous to the scatter of daylight which produces the blue color of the sky and similarly explains the blue color of ecchymoses and the blue spots on the forearms of narcotic addicts which represent carbon particles in the dermis.) Exogenous ochronosis from absorption of phenol through skin is of little clinical importance at present.

A more detailed description of pigmentation occurring in various clinical conditions is beyond the scope of this paper. The entities described above and the physiology of melanin production have been reviewed to promote interest in and a more complete understanding of these curious phenomena.

References

1. Allen, A. C.: Disorders of Pigmentation, in: The Skin, A Clinicopathologic Treatise, p. 162. St. Louis: C. V. Mosby, 1954.
2. Becker, S. W.: Skin: Melanin Pigmentation Produced by Physical Agents; in Medical Physics, 1: 1430. Chicago: Year Book Publishers, 1944.
3. Becker, S. W.: Pigmentary diseases of the skin. Clinics, 3:886, 1944.
4. Becker, S. W., and Obermayer, M. E.: Modern Dermatology and Syphilology, Edition 2, p. 324. Philadelphia: J. B. Lippincott Co., 1947.
5. Christensen, P. D.: Personal communication.
6. Crowe, F. W., and Schull, W. J.: Diagnostic importance of cafe-au-lait spots in neurofibromatosis. Arch. Int. Med., 91:758, 1953.
7. Editorial: Melanin, New England J. Med., 249: 910, 1953.
8. Edwards, E. A., and Duntley, S. Q.: Pigments and color of living human skin. Am. J. Anat., 65:1, 1939.
9. Edwards, E. A., and Duntley, S. Q.: An analysis of skin pigment changes after exposure to sunlight. Science, 90:235, 1939.
10. Jeghers, H.; McKusick, V. A.; and Katz, K. H.: Generalized intestinal polyposis and melanin spots of the oral mucosa, lips, and digits. New England Med., 241:995 and 1031, 1949.
11. Jeghers, H.: Skin: Color, in Health and Disease; in Medical Physics, II: 984, Chicago: Year Book Publishers, 1950.

(Continued on Page 831)

Continuation Studies

Anesthesia for Emergency Surgery

J. R. GORDON, M.D.
D. S. P. WEATHERHEAD, M.D.
F. H. VAN BERGEN, M.D.
Minneapolis, Minnesota

THE ANESTHETIC care of the emergency surgical patient presents many challenging problems. These involve an accurate appraisal of the patient's condition, hurried preparation for surgery, and an astute estimation of the amount of additional stress he may tolerate. The critical condition of many of these patients imposes stringent limitations upon the anesthetic techniques and agents employed. In addition, the immediate postanesthetic period may require the utmost diligence on the part of both the surgeon and anesthesiologist.

Preoperative Assessment and Preparation of the Patient

The Airway.—The maintenance of a patent air passage from the oral and nasal apertures to the alveoli is of prime importance. The airway may be obstructed in emergency conditions from a variety of causes.

Upper respiratory obstruction may occur due to the presence of foreign bodies including blood and vomitus, laryngospasm resulting from injuries of the neck and brain stem, anatomic relaxation of the muscles of the tongue and jaw accompanying the unconscious state, and derangement of the supporting bony and muscular structures.

Lower respiratory obstruction is seen in fractures of the tracheal cartilages, bronchospasm accompanying physical and chemical irritation of the bronchial tree and edema of the bronchial mucosa.

Obstruction at the alveolar level is most commonly caused by aspiration of blood, pus or vomitus, pulmonary edema and atelectasis.

Treatment of the obstructed airway is of immediate importance. All mucus and blood must be aspirated from the air passages and solid foreign matter removed. The continuity of the airway may be temporarily maintained by holding the jaw and tongue well forward and, if necessary, by inserting an oropharyngeal airway.

In the unconscious patient the best method of effecting and maintaining a continuously patent air passage is by endotracheal intubation with a cuffed Magill tube. In addition, inflation of the cuff will prevent further aspiration of foreign substances into the tracheobronchial tree.

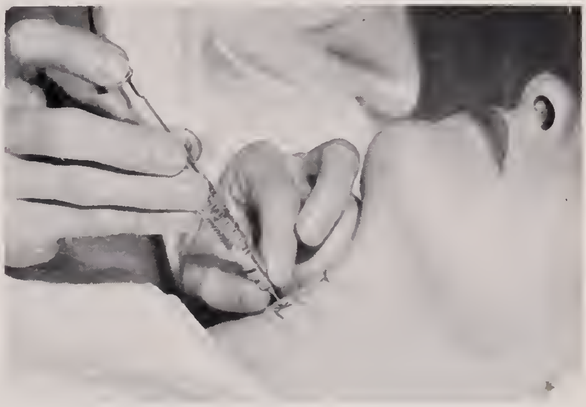


Fig. 1. Translaryngeal anesthetization—The 1.5-inch 20-gauge needle has been inserted through the cricothyroid membrane and the position of the point within the larynx confirmed by the aspiration of air. Note the outline of the thyroid and cricoid cartilages and the position of the needle in the midline perpendicular to the skin.

If the protective laryngeal reflexes are still present they may be obtunded by translaryngeal anesthetization[1] of the laryngotracheal mucosa (Fig. 1). This is accomplished by the insertion of a 20 gauge needle through the cricothyroid membrane into the lumen of the larynx. Through this needle 2 cc of 5 per cent solution of Cyclaine®* is rapidly injected. In addition, the mouth and pharynx may be sprayed with a nebulizer to obtain topical anesthesia above the glottis. Following this, intubation is readily accomplished.

If it is necessary to resort to tracheotomy, a cuffed kink-proof tracheotomy tube is preferable to the standard silver tube, especially if anesthesia must be administered subsequently (Fig. 2). The tracheobronchial tree may be thoroughly suctioned by utilizing the curvature of a specially designed long catheter (Fig. 3) to aspirate selectively both main stem bronchi. Since bronchoscopy may produce considerable hypoxia in itself, every effort should be made to avoid this procedure in the seriously ill or injured patient.

---

*Cyclaine®, is the trademark of Sharp and Dohme, Inc., for its brand of hexylcaine.

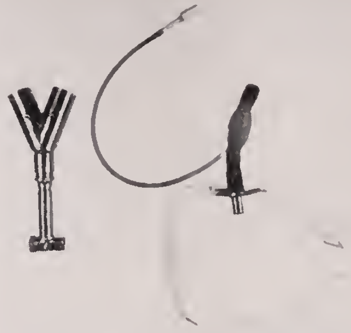


Fig. 2. Tracheotomy tube and Y-connector. The flexible kink-proof tracheotomy tube has a spiral wound supporting wire in the wall. The tube is cuffed and the conventional bevel has been removed.

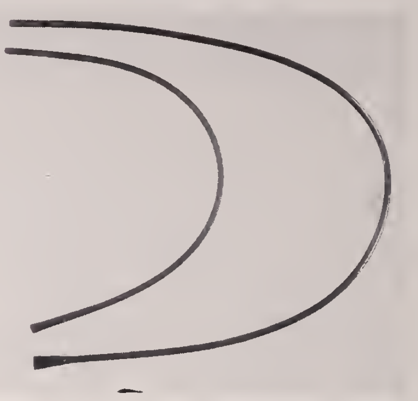


Fig. 3. The Minnesota P.A.R. catheter. This is a special modified 24-inch Bardic De Lee catheter. In addition to the whistle tip, there are two staggered eyelets 3/16-inch and 6/16-inch from the end. A shorter Friend catheter is shown for comparison.

In addition to the establishment of a patent, protected airway, it may be necessary to initiate, or compensate ventilation. Respiratory paralysis may follow head or neck injuries and respiratory impairment of varying degrees may result from insults such as pneumothorax, blast injuries and ruptured diaphragm. A normal minute volume can best be secured by the application of intermittent positive pressure breathing, although in emergency situations simpler methods such as mouth to mouth breathing, may be life saving (Figs. 4, 5, 6 and 7).

The Circulation.—The candidate for emergency surgery is often in a state of impending shock—a progressive vasoconstrictive reaction to a reduction in the central circulating blood volume. Although the originating causes of shock may vary, they all tend to produce a state of circulatory deficiency leading to failure of adequate tissue perfusion with a resultant cellular hypoxia.

Since both degree and duration of the state of shock are prognostically important, treatment must be instituted rapidly. The circulatory blood volume is restored by the establishment of an intravenous infusion through a 15 gauge needle. When the superficial veins are collapsed, the external jugulars may still be available. If this is liable to be time-consuming, it is preferable to "cut down" on a vein.

While awaiting whole blood for transfusion, plasma or dextran[2,3] may be used. Intra-arterial infusion of blood has generally not proven any more rapid or effective than intravenous routes in hemorrhagic shock,[4,5] recovery of the circulation being more a function of the rate, not of the route, of transfusion.

Other therapeutic measures have been recommended for the shocked patient. These include Trendelenburg position with elevation of the legs, oxygen administration, and the injection of vasopressors. It should be noted that the administration of appropriate drugs should be by the intravenous route whenever possible in shocked patients.[6] In these cases, absorption from subcutaneous and intramuscular sites is delayed and, as a result, when the condition of the patient improves, dangerously large quantities of previously deposited drugs are absorbed into the circulation at one time.

A *hypertensive response* to injury has been reported following experiences in the two World Wars and the Korean War.[7] The response is more common in children and young adults and most frequently follows injury involving the limbs. The exact mechanism is obscure. The response usually subsides following induction of general or spinal anesthesia. It is also ended by autonomic blocking agents. Profound hypotension has fol-

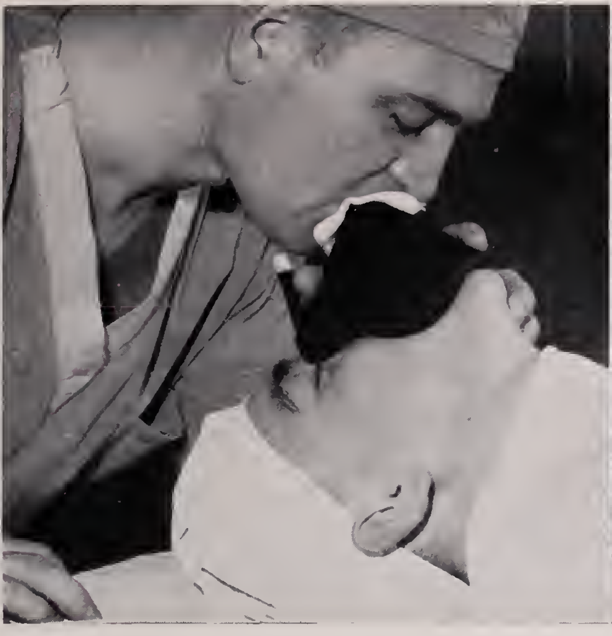


Fig. 4. Mouth-to-mask respiration. The patient's jaw is supported by the fingers of the left hand and the operator inflates the lungs by blowing into the mask. If the tongue obstructs airflow an oral airway should be inserted.

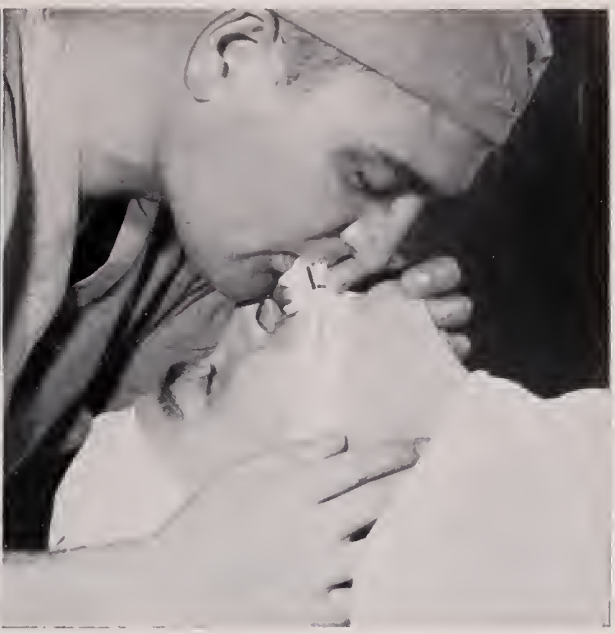


Fig. 5. Mouth-to-tube breathing. In this case an endotracheal tube is in place and the operator blows into the tube at the rate of about 15 times a minute.

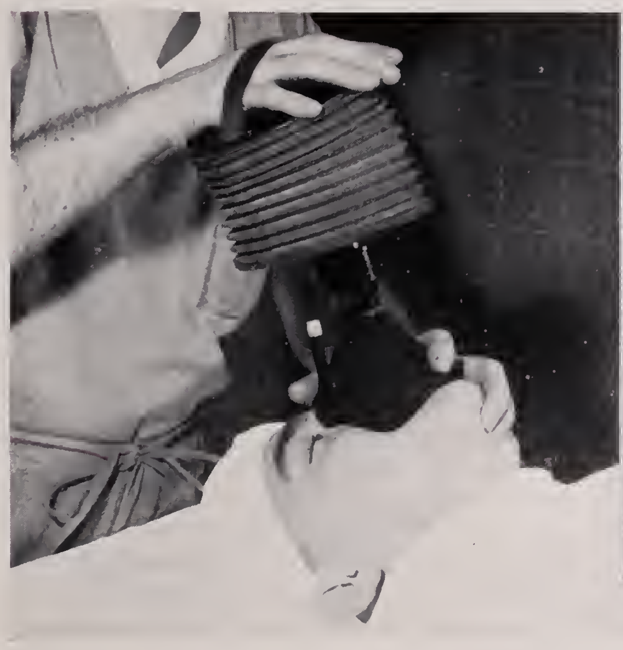


Fig. 6. The Kreiselman hand bellows respirator. As the bellows-type bag is elevated by means of the hand strap, room air is sucked in through a valve at the top of the bag. When the bag is compressed the contained air is delivered to the patient's lungs. A second valve between the mask and the bag permits expired air to escape and prevents rebreathing.

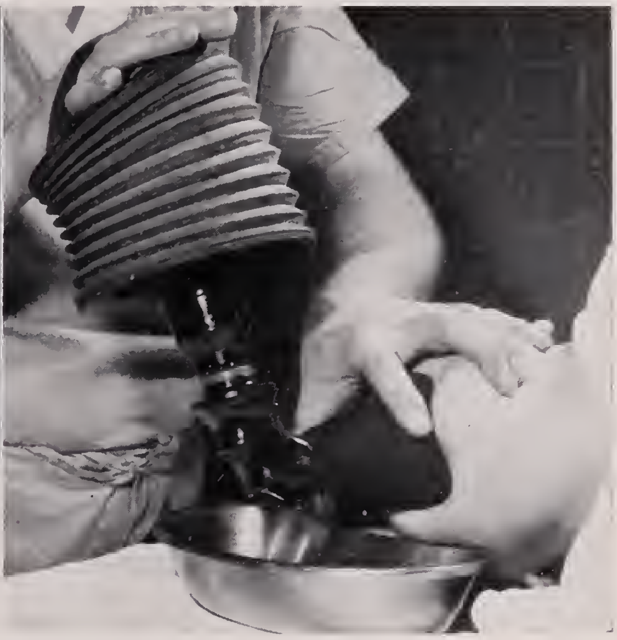


Fig. 7. A connecting elbow is used with the patient on his side to facilitate drainage from the respiratory tract.

lowed induction of anesthesia with both ether and pentothal in these casualties.

The hypertensive response should be viewed against the background of the severity of the injury and, in some cases, adequate and early transfusion is not contraindicated by the raised blood pressure. In the light of recent knowledge concerning this response, caution should be observed even in emergency patients who present with a normotensive picture since their apparently satisfactory circulatory status may be misleading. The induction of anesthesia may be followed by a surprising deterioration in these patients.

Stress Response.—Poor stress responses may be seen in aged and debilitated patients, those patient subjected to long periods of mental stress and tension, and patients who have received ACTH or cortisone therapy within the preceding year. These individuals exhibit a minimal or absent homeostatic response to illness or injury and evidence a gradual deterioration in blood pressure, pulse, and respiration. They respond poorly to the usual resuscitative measures. Treatment of this condition with 100 to 200 mg. hydrocortisone will often effect gratifying improvement in the status of these patients. When high blood levels of the hormone are required rapidly 2 cc (100 mg.) of Solu-Cortef®* may be injected intravenously.

Complicating Diseases.—Certain complicating diseases and conditions, although not related to the immediate treatment, may strongly influence the outcome of the procedure undertaken. When surgical intervention is elective in patients with these diseases, time can be taken to bring them to a satisfactory state for their anesthesia and surgery. In the emergency patient, different methods of therapy and anesthesia must often be employed so that a minimal delay compatible with safety is entailed. Some of the more important of these conditions will be discussed.

1. *Coronary Artery Disease.*—The patient with coronary artery disease is obviously extremely sensitive to hypoxia. Evidence is accumulating that the rate of coronary blood flow is inversely proportional to the amount of oxygen carried by the blood.[8] In spite of coronary dilatation and adjustments in flow rate to increase the arterio-venous oxygen difference across the coronary circulation, even minor reductions in oxygen saturation may be disastrous to these hearts. It is often impossible to evaluate with any accuracy their ability to withstand the stress of anesthesia and surgery.

Hypotension on the basis of vasodilatation, likewise, is poorly tolerated despite the fact that the reduced peripheral resistance places a diminished demand upon the work of the heart. Again, one cannot be certain at what point the reduced pressure will significantly impair coronary flow.

2. *Congestive Heart Failure.*—Surgery should be postponed in the critically ill or injured patient with congestive failure. Correction of the failing heart and restoration of normal pulmonary function should be considered a part of the emergency first-aid care. Even when the patient has been digitalized and returned to compensation, the stress of anesthesia and surgery may precipitate further decompensation. This is evidenced by elevation of venous pressure, acceleration of the heart rate, dilatation of the heart and a low arterial blood pressure. In these situations acetyl strophanthidin[9] has proved a most useful drug. The drug can be given according to the method of Levine[10] in divided doses up to three to six cat units (0.6-1.2 mg.). With the help of electrocardiographic monitoring, the precise optimal level of digitalization can be attained, usually with gratifying results.

3. *Respiratory Acidosis.*—Not infrequently the emergency patient is in a state of respiratory acidosis. Vagal cardio-inhibition is increased in the presence of a decreased blood pH.[11,12] Precipitous falls in blood pressure and cardiac arrhythmia may follow too rapid return of the pH to normal.[13]

During uncompensated respiratory acidosis the concentration of plasma potassium ion is increased. In the initial period of correction of the acidosis there is a further transient increase in the hyperkalemia. This may be accompanied by evidence of potassium intoxication including ventricular fibrillation.[14,15]

4. *Pulmonary Emphysema.*—Emphysema is associated with a diminution of elastic tissue, tearing of alveolar septa and a decrease in the pulmonary capillary bed. Persons with emphysema have varying degrees of compensated respiratory

---

*Solu-Cortef®, is the trademark of the Upjohn Company for its brand of hydrocortisone hemisuccinate sodium.

acidosis depending on the severity and duration of the disease.[16] The ventilation response to carbon dioxide is decreased in proportion to the degree of CO_2 retention. As this retention is corrected, the response to CO_2 does not improve as it would in the patient with respiratory acidosis without pulmonary disease. In general, it is not advisable to upset their acid-base balance in any manner.

The patient with severe emphysema may have an excessive hypoxic chemoreceptor drive and may be readily rendered apneic when the high inspired oxygen concentrations associated with anesthesia are utilized.

There is also the mechanical problem of anesthetized emphysematics. These patients achieve expiration in the time available by active contraction of their expiratory muscles. Under anesthesia this active assistance disappears and expiration becomes a passive phenomenon depending on the elastic recoil of fibers stretched by the preceding inspiration. When considerable reduction of elastic fibers exists, less force is available to overcome frictional resistance in the tissues and airway resistance and as the force available to cause air flow is decreased expiration becomes prolonged.

5. *Asthma.*—Bronchial asthmatics may have considerable expiratory obstruction, decreased vital capacity and increased residual lung volume even in the symptom free periods between attacks. Many general anesthetic agents may precipitate bronchoconstriction in the asthmatic. Pentothal, cyclopropane and extracts of curare are among the offenders. In the short time available before urgent surgery these patients may be prepared with rapid bronchodilation therapy consisting of intravenous antihistamines and/or Isuprel.®* Isuprel has proved to be a most useful drug in bronchospasm.[17] It is relatively free of the undesirable side effects of epinephrine and may be used on patients anesthetized with cyclopropane.

If one considers the obstructive phenomenon of asthma to be mainly that of an orifice (turbulent flow), then the use of a low density gas such as helium is indicated. If one is dealing with a constriction continued in a linear direction (a tube), viscosity is the predominant factor and there is no advantage in substituting helium. Although greater relief is obtained with a mixture of 80 per cent helium and 20 per cent oxygen,[18] the degree of hypoxia may dictate higher concentrations of oxygen even though this entails some increase in the work of breathing.

6. *Liver Disease.*—Function tests show that even in a patient in supposedly good health, anesthesia and surgical trauma may cause transient hepatic insufficiency.[19] Severely ill or injured patients (especially those in shock or who have received multiple transfusions) exhibit a marked impairment of liver function.

All anesthetics, even local, decrease liver glycogen to some extent. Agents which markedly impair hepatic function and possibly increase liver damage are chloroform, ethyl chloride, trichlorethylene, tribromethanol, divinyl ether and diethyl ether. These deleterious effects of the above agents are increased if respiratory or circulatory hypoxia is allowed to exist.

7. *Renal Disease.*—A number of conditions such as hypoxia, shock and stress of any kind can alter renal function to a great extent. With general anesthesia there is a reduction in glomerular filtration rate, effective renal plasma flow and the output of water and electrolytes. Presumably an intrarenal vasoconstriction occurs. These changes are nonspecific so far as the anesthetic agent is concerned. The depression in function is associated with the state of general anesthesia and appears to be related to the depth of anesthesia. Urgent surgery should thus be conducted in the lightest feasible plane.

8. *Diabetes.*—The patient for emergency surgery without benefit of complete diabetic evaluation may be anesthetized with cyclopropane, spinal anesthetics or a combination of the weaker gases such as nitrous oxide with pentothal and a muscle relaxant. Treatment of the diabetic patient should be instituted as rapidly as possible and continued during and after surgery. The volatile vapors produce profound hyperglycemia and a marked depletion of liver glycogen and are best avoided.

9. *Transfusion.*—Patients requiring urgent surgery frequently need massive transfusion of whole blood before and during the intervention. Among the undesirable effects of citrated whole blood is

---

*Isuprel®, is the trademark of Winthrop-Stearns, Inc., for its brand of isopropyl adrenaline.

citrate intoxication leading to a reduced concentration of ionized plasma calcium;[20] production of metabolic acidosis; elevation in the concentration of plasma potassium due to the acidosis and progressive hemolysis of bank blood.

Choice of Anesthetic Management

Regardless of the choice of method of anesthetic management, one must adhere to a few general principles. These include the maintenance of a patent airway, adequate ventilation with elevated oxygen tensions and the maintenance of a normal alveolar CO_2 concentration. Every effort to avoid deep general anesthesia should be exercised.

Conduction Anesthesia.—Local infiltration and regional nerve block are the safest of all anesthetic techniques in the severely ill patient. The concentration and volume of drugs used should be reduced when such factors as hyperpyrexia, debility and shock are present. In patients whose myocardial reserve is limited these agents may be harmful by further depressing the heart. The use of this method of anesthesia does not preclude maintenance of a patent airway and adequate ventilation where indicated.

Spinal Anesthesia.—A patient in shock should not be given a spinal anesthetic. Paralysis of the sympathetic fibers maintaining vasomotor tone results in precipitous falls in blood pressure. Caution should be exercised in the apparently hypertensive or normotensive casualty since the pressure may be merely a result of the "hypertensive response" mentioned above. In this instance, subarachnoid block may result in a hypotension stubbornly refractory to the usual therapy.

Rupture of the distended bowel in intestinal obstruction may occur due to the cholinergic effect of spinal anesthesia on the intestinal tract.

General Anesthesia.—The aspiration of stomach contents during the induction of anesthesia in emergencies is an ever present threat. One must be assured that the stomach is emptied by gastric lavage followed by continuous Wangensteen suction. As an additional safeguard, especially to prevent regurgitation of solid particles not removable by suction, a cuffed esophageal tube should be used. Tubes such as the Miller-Abbott or Sengstaken, although intended for other purposes, are quite satisfactory. Recently several special cuffed tubes have been reported expressly for this purpose.[21] The tube should be introduced before the induction of anesthesia and the cuff inflated. The tube is pulled back so the cuff is maintained against the cardia until a cuffed endotracheal tube can be inserted to insure the integrity of the airway. The esophageal tube is used again during extubation of the trachea and maintained in its position until the patient is sufficiently recovered to safeguard his airway independently. The use of this technique is possible in pediatric anesthesia as well.

The endotracheal intubation under translaryngeal anesthetization, in addition to preventing aspiration, permits the use of a light plane of anesthesia and avoids the potential dangers of hypoxia during the induction stage.

1. *Ether.*—Recent reports have indicated that the use of ether may be hazardous in the anesthetic management of the seriously ill patient. The changes of intermediary metabolism such as hyperglycemia and glycopenia are well known. Hershey and Zweifach[22] demonstrated a deleterious effect of ether on peripheral vascular homeostasis. Brewster[23] has shown that diethyl ether leads to a reflex release of epinephrine and nor-epinephrine from the adrenal medullae and the sympathetic nerve endings. In the absence of circulating epinephrine and nor-epinephrine, ether exerts a direct depressant (negative inotropic) effect upon the myocardium producing a marked decrease in cardiac output at blood ether concentrations required for surgical anesthesia. In the face of a subnormal or exhausted sympathoadrenal response, the use of ether may thus lead to serious deterioration of the respiratory and cardiovascular systems.

Ether anesthesia leads to an increase in fixed acids with a decrease in serum bicarbonate. An increasing metabolic acidosis results[24-26] which, although of no great significance in the healthy patient, must be considered in conditions of shock, dehydration and other situations commonly found in urgent surgical candidates. It is of prime importance to avoid the addition of respiratory acidosis (hypoventilation), encountered in the deeper surgical planes of ether anesthesia, to the metabolic component. This is done by meticulous attention to the augmentation of respiration with a tendency to err on the side of hyperventilation since a respiratory alkalosis may help avoid dangerously low pH levels in view of the lack of time for renal adjustment of pH to occur.

The dangers of acidosis have been mentioned previously. They include ventricular fibrillation following sudden correction of the severe acidosis, increased cardiac vagotonicity and shifts in plasma potassium ion. Radford[27] advises an increase in ventilation of +20 per cent lowering the P_A CO_2 to approximately 30 mm. of mercury with ether.

2. *Other Volatile Agents.*—The production of metabolic acidosis by chloroform[28] is similar to that of ether. In addition, the low margin of safety with this agent together with its circulatory, hepatic and central nervous systems toxicity have today restricted its use to only a few centers.[29]

Divinyl ether, trichlorethylene and ethylchloride have toxic effects which so limit their usefulness that their application in emergency anesthesia rarely arises.[30]

3. *Cyclopropane.*—Cyclopropane is the most potent of the commonly employed anesthetic gases.[31] It does not produce injury to the liver or kidney and permits the use of high concentrations of oxygen throughout all depths of anesthesia.

The production of respiratory acidosis by cyclopropane is due to its profound respiratory depressant effect and is circumvented by diligent augmentation of respiration.[32] A parallel metabolic acidosis may accompany the respiratory component[33] but is not clinically significant. An increase in arterial and central venous pressures may occur in the absence of respiratory acidosis or anoxia.[34]

The only other objectionable features of this gas are its potential for the production of cardiac arrhythmias and its flammable nature. The avoidance of arrhythmias is probably a matter of adequate experience with this agent.

Because of the absence of deleterious metabolic upset and the minimal alteration of peripheral circulatory dynamics with better maintenance of compensating cardiovascular responses in shock, cyclopropane is an especially useful agent in the urgent surgical patient. Deep anesthetic planes with cyclopropane, however, are as deleterious to the shocked patient as with pentothal or diethyl ether.[35]

4. *Nitrous Oxide.*—Nitrous oxide would undoubtedly be the ideal gas anesthetic except for the fact of its low anesthetic potency. It can be used to advantage for its analgesic properties when combined with other agents such as in the nitrous oxide-oxygen, intravenous barbiturate and muscle relaxant techniques.

5. *Ultra Short Acting Barbiturates.*—(a) Pentothal (Thiopental Sodium) is the most frequently employed of the intravenous anesthetics. Many of the contraindications to the use of pentothal such as severe trauma, shock, and cardiac failure are relative rather than absolute and when used judiciously this agent has a useful purpose in emergency anesthesia.

Zwiefach's work on the omental circulation in shock placed pentothal as less desirable than cyclopropane but more so than ether with regard to peripheral compensatory responses.[22]

In patients suffering from shock, pentothal must be administered slowly and in small dosage increments. The amount of drug required to produce narcosis is often markedly reduced in the severely ill or injured patient.

(b) Lilly #22451. During the past few months we have done preliminary studies on a new ultra short-acting barbiturate—Lilly #22451. This compound is a nonthiobarbiturate without marked cumulative properties. At present, our series of cases in which this drug was employed is too small to permit any conclusions. However, we have used it in cases of oligemic shock, severe toxemia, debility and hypertension, and are favorably impressed with some of the early results. Nitrous oxide-oxygen mixtures are used in conjunction with the barbiturate. Within minutes after the discontinuance of anesthesia with this technique, the patient regains protective reflexes, adequate ventilatory exchange and consciousness with minimal residual somnolence. To date, no precipitous falls in blood pressure have been noted during induction of anesthesia and no progressive cardiovascular deterioration has been encountered during prolonged use of the agent. Sensitization of the laryngeal musculature to stimulation in the mouth and pharynx appears to be lacking. The potential advantages of such an agent over the currently available thiobarbiturates is readily apparent and we hope to report our findings in the near future.

6. *Muscle Relaxants.*—Muscle relaxants permit light anesthetic planes to suffice for any surgical procedure in the emergency patient. The newer

synthetic products possess few of the disadvantages of earlier preparations.[36] They are largely devoid of histamine liberating qualities, cumulative action and hypotensive properties.

Flaxedil® (Gallamine Triethiodide)* is an effective relaxant possessing a strong cardiac vagolytic property which may offer the poor risk patient some protection against reflex cardiac disturbances. The accompanying elevation in pulse rate may be undesirable in the presence of cardiovascular disease. Flaxedil®, like d-tubocurare, is mostly excreted unchanged by the kidneys. Since impairment of renal function is often present in emergency patients, these agents must be used with great caution to avoid prolonged respiratory depression.

Succinyl choline is an ultra short acting relaxant which is rapidly hydrolyzed by plasma and tissue cholinesterases. Its advantages include rapid reversibility of action and a minimum of side effects. Prolonged effects are prone to occur in the aged, debilitated patient, in anemia and in liver disease due to low pseudocholinesterase levels in plasma. The effects of succinyl choline are not antagonized by Tensilon®** or Prostigmin®† but may be potentiated by these drugs.

The muscle relaxants may produce prolonged respiratory depression in the poor risk patient. In the presence of a potassium deficiency, these effects may often be reversed by the intravenous administration of a potassium chloride solution (0.3 per cent at 100 to 120 drops per minute) up to 1.5 grams of potassium over a period of one hour. The rapid administration of potassium intravenously is not without danger and its effects should be carefully monitored.

7. *Chlorpromazine.*—Chlorpromazine has the property of potentiating analgesic and anesthetic drugs and is therefore useful in the management of the urgent surgical patient. The patient may be prepared by the intravenous administration of small (2 mg.) increments two to three minutes apart until from ten to twenty mgs. have been given. Since chlorpromazine has a hypotensive property of its own, the blood pressure should be monitored constantly during its administration to detect any tendency toward hypotension.

Concluding Remarks

In this discussion an attempt has been made to outline some general principles underlying the anesthetic management of emergency surgical patients. With this in mind, one is better able to deal with individual problems as they arise. In those cases where local infiltration or conduction anesthesia is not applicable, it may be used to supplement light general anesthesia. We have come to realize these patients do not need, and indeed will not tolerate, any deep anesthesia. The patient can often be maintained in a state of analgesia in which he may still respond to questioning by moving his head, yet is spared the knowledge and sensation that surgery is being performed.[37,38] If these concepts of emergency surgical anesthesia are constantly appreciated, many of the dangers and physiologic aberrations can be minimized.

References

1. Bonica, J. J.: Transtracheal anesthesia for endotracheal intubation. Anesthesiology, 10:737 (Nov.) 1949.
2. Pirani, C. L.; Juster, R.; Frock, H. F.; Consolazio, C. F., and Ingraham, R. C.: The use of dextran in hemorrhagic shock. J. Appl. Physiol., 8:193-202 (Sept.) 1955.
3. Tarrow, A. B.: The plasma volume expanders. Anesthesiology, 16:598-605 (July) 1955.
4. Case, R. B.; Sarnoff, S. J.; Warthe, P. E.; Sarnoff, L. C.: Intra-arterial and intravenous blood infusion in hemorrhagic shock. J.A.M.A., 152:208-212 (May) 1953.
5. Theilen, E. O.; Paul, M. N.; Gregg, D. F.: A comparison of effects of intra-arterial and intravenous transfusions in hemorrhagic hypotension of coronary, blood flow, systemic blood pressure and ventricular and diastolic pressure. J. Appl. Physiol., 7:248-252 (Nov.) 1954.
6. Beecher, H. K.: Resucitation and Anesthesia for Wounded Men. Springfield, Illinois: Charles C Thomas, 1949.
7. Howard, J. M.; Artz, C. P.; and Stahl, R. R.: Hypertensive response to injury. Ann. Surg., 141: 327, 1955.
8. Hackel, D. B.; Kleinerman, J.; and Goodale, W. T.: Effect of anoxia on myocardial carbohydrate metabolism and coronary blood flow into intact dogs. Federation Proc., 12:59 (March) 1953.
9. Gold, H.; Modell, W.; Kwit, N. T.; Shane, S. J.; Dayrit, C.; Kramer, M. L.; Zahm, W.; and Otto, H. L.: Comparison of Ouabain with Strophanthidin-3-acetate by intravenous injection in man. J. Pharm. & Exper. Therap., 94:39-43 (Sept.) 1948.
10. Lown, B., and Levine, S. A.: Current Concepts in Digitalis Therapy. Boston: Little, Brown & Co., 1954.
11. Campbell, G. S.; Haddy, F. J.; and Brown, E. B., Jr.: Vagal inhibition of the dog heart at different ph levels. Federation Proc., 12:23, Part I (March) 1953.
12. Campbell, G. S.; Haddy, F. J.; and Brown, E. B., Jr.: Effect of ph changes on vagal inhibition of the heart. Surgical Forum, 1952, San Francisco.
13. Miller, F. A.; Brown, E. B., Jr.; Van Bergen, F. H.; and Varco, R. L.: Respiratory acidosis: Its

---

*Flaxedil®, is the trademark of Lederle Laboratories for its brand of gallamine triethiodide.

**Tensilon®, is the trademark of Hoffmann-LaRoche, Inc., for its brand of Edrophonium Chloride.

†Prostigmin®, is the trademark of Hoffmann-LaRoche, Inc., for its brand of neostigmine.

relationship to cardiac function and other physiologic mechanisms. Surgery, 32:171-183 (Aug.) 1952.
14. Scribner, B. H.; Fremont-Smith, K.; and Burnell, J. M.: The effect of acute respiratory acidosis on the internal equilibrium of potassium. J. Clin. Invest., 34:1276-1285 (Aug.) 1955.
15. Scribner, B. H.; Bogardas, G. M.; Fremont-Smith, K.; and Burnell, J. M.: Potassium intoxication during and immediately following respiratory acidosis. J. Clin. Invest., 33:965, 1954.
16. Tenney, S. M.: Ventilatory response to carbon dioxide in pulmonary emphysema. J. Appl. Physiol., 6:477-484 (Feb.) 1954.
17. Cohen, E. N.; Van Bergen, F. H.; and Knight, R. T.: Broncodilation under anesthesia with 1 (3, 4-Dihydroxyphenyl) 2 isoprophyl aminoethanol hydrochloride. Anesthesiology, 10:451-467 (July) 1949.
18. Barach, A. L.: Physiologic Therapy in Respiratory Diseases. Philadelphia: J. B. Lippincott Co., 1948.
19. Hugill, J. T.: Liver function and anesthesia. Anesthesiology, 11:567-588 (Sept.) 1950.
20. Bunker, J. P.; Stetson, J. B.; Coe, R. C.; Grillo, H. C.; and Murphy, A. J.: Citric acid intoxication. J.A.M.A., 157:1361-1367 (April 16) 1953.
21. Zuck, D.: A cuffed esophageal tube. Lancet, 1017 (Nov. 12) 1955.
22. Hershey, S. G., and Zweifach, B. W.: Peripheral vascular homeostasis in relation in anesthetic agents. Anesthesiology, 11:145-154 (March) 1950.
23. Brewster, W. R., Jr.; Isaacs, J. P.; and Wainø Anderson, T.: Depressant effect of ether on myocardium of the dog and its modification by reflex release of epinephrine and nor-ephinephrine. Am. J. Physiol., 175:399-414 (Dec.) 1953.
24. Van Slyke, D. D; Austin, J. H.; and Cullen, G. E.: Effect of ether anesthesia on acid-base balance of blood. J. Biol. Chem., 53:277-292, 1922.
25. Taylor, F. H., and Roose, A.: Disturbances in acid-base balance during ether anesthesia. J. Thoracic Surg., 20:289-295 (Aug.) 1950.
26. Radford, E. P., Jr.; Ferris, B. G. J.; and Kriete, B. D.: Clinical use of nomogram to estimate proper ventilation during artificial respiration. New England J. Med., 251, 877-883 (Nov. 25) 1954.
27. Radford, E. P., Jr.: Ventilation standards for use in artificial respiration. J. Appl. Physiol., 7:451-460 (Jan.) 1955.
28. Cullen, C. E.; Austin, J. H.; Kornblum, V.; and Robinson, H. W.: Initial acidosis in anesthesia. J. Biol. Chem., 56:625-661, 1923.
29. Waters, R. M.: Chloroform. A Study after 100 Years. Madison, Wisconsin: University of Wisconsin Press, 1951.
30. Martin, S. J., and Rovenstine, E. A.: Vinethene: A laboratory and clinical evaluation. Anesthesiology, 2:285, 1941.
31. Robbins, B. H.: Cyclopropane Anesthesia. Baltimore: The Williams and Wilkins Co., 1940.
32. Buckley, J. J.; Van Bergen, F. H.; Dobkin, A. B.; Brown, E. B., Jr.; Miller, F. A.; and Varco, R. L.: Postanesthetic hypotension: Its relationship to hypercapnia. Anesthesiology, 14:226-237 (May) 1953.
33. Frumin, M. J.; Schwartz, H.; Ballinger, C.; Holaday, D. A.; and Papper, E. M.: Respiratory and metabolic responses to cyclopropane anesthesia in man. Federation Proc., 12:322-323, 1953.
34. Price, H. L. Conner, E. H.; and Dripps, R. D.: Concerning the increase in central venous and arterial blood pressures during cyclopropane anesthesia in man. Anesthesiology, 14:1-9, 1953.
35. Hershey, S. G.; Zweifach, B. W.; Rovenstine, E. A.: Effects of depth of anesthesia on behaviour of peripheral vascular bed. Anesthesiology, 14:245-254 (May) 1953.
36. Foldes, F. F.; Machaj, T. S.; Hunt, R. D.; McNall, P. G. and Carberry, P. C.: Synthetic muscle relaxants in anesthesia. J.A.M.A., 150:1559-1566 (Dec. 20) 1952.
37. Wasmuth, C. E., and Hale, D. E.: Changing concepts of anesthestic depth. Cleveland Clin. Quart., 21:46-53 (Jan.) 1954.
38. Artusio, J. F., Jr.: Di-ethyl ether analgesia: A detailed description of the first stage of ether anesthesia in man. J. Pharmacol. & Exper. Therap., 111:343-348 (July) 1954.

CARCINOMA OF THE LARYNGOPHARYNX

(Continued from Page 786)

determine if surgical excision is practical. Surgery is contra-indicated if the lesion has become densely adherent to the cervical spine or the major blood vessels; or if both the anterior and posterior cervical triangles are extensively involved. Distant spread beyond the confines of the cervical lymphatics precludes anything but palliative treatment.

Summary

Radical excisional surgery has much to offer in selected cases of carcinoma of the laryngopharynx. The operative mortality is low and the functional result is good. While the five-year cure rate is not yet definitely established, it seems certain to be considerably greater than can be obtained with radiation therapy.

References

1. Braund, R. R., and Cocke, E. W., Jr.: The surgical management of advanced cancer of the oropharynx, hypopharynx, larynx and cervical esophagus. J. Tennessee M. A., 46:452-457 (Dec.) 1953.
2. Cade, S.; Raven, R. W.; and Reidy, J. P.: Discussion on surgical treatment of carcinoma of the pharynx. Proc. Roy. Soc. Med., 46:769-782 (Sept.) 1953.
3. Coleman, F. P., and Brawner, D. L.: Carcinoma of the cervical esophagus. Arch. Surg., 62:102-111 (Jan.) 1951.
4. Conley, J. J.: One-stage radical resection of cervical esophagus, larynx, pharynx, and neck, with immediate reconstruction. Arch. Otolaryng., 58: 645-654 (Dec.) 1953.
5. Farina, R.: Total pharyngoneoplasty. Plast & Reconstruct. Surg., 6:58-61 (July) 1950.
6. Hynes, J. F.: Cancer of the laryngopharynx. Delaware State M. J., 23:86-92 (April) 1951.
7. Ogura, J. H., and Bello, J. A.: Laryngectomy and radical neck dissection for carcinoma of the larynx. Laryngoscope, 62:1 (Jan.) 1952.
8. Owen, R. D.: Section of Laryngology. Proc. Roy. Soc. Med., 43:157-170 (March) 1950.
9. Raven, R. W.: Cancer of the oropharynx. Brit. J. Surg., 39:503-505 (May) 1952.
10. Wookey, Harold: The surgical treatment of carcinoma of the hypopharynx and esophagus. Brit. J. Surg., 35:249-266, 1948.

Pulmonary Studies

Bronchography in Chest Diseases

S. H. TSAI, M.D.
Oak Terrace, Minnesota

THERE has been an increase in the popularity of bronchography in the recent years, due mainly to the availability of newer contrast media. Unlike iodized oil (Lipiodol), these new media are eliminated rapidly from the bronchial tree, avoiding persistence of obscuring shadows on subsequent roentgenograms. These substances may be classified into two groups. One is the original iodized oil thickened by the addition of a powdered sulphonamide. The other consists of the so-called water-soluble compounds which are aqueous preparations of iodopyracet or one of its derivatives. The more commonly used of these compounds are Umbradil, Ioduron B, and Dionosil. Dionosil is also marketed in an oily form in which it is suspended in peanut oil. Although not entirely free from hazards,[1] the use of the new opaque media represents a major advance in the field of bronchography.

Bronchography often supplies information not obtained ordinarily by other forms of examination, including conventional roentgenography, body section roentgenography and bronchoscopy. The most important example, of course, is the detection of bronchiectasis. In addition to establishing the diagnosis, a bronchogram may clearly reveal the type, severity, location and extent of the bronchial dilatations. Other bronchial conditions, such as congenital anomalies, obstruction or stenosis, fistula and distortion are also readily visualized. The occurrence of contraction, overexpansion and displacement of pulmonary lobes or segments may be deduced from changes in the pattern of the bronchial tree. Knowledge derived from studying a bronchogram may prove valuable to the thoracic surgeon.

Some bronchographic findings are more or less characteristically associated with certain diseases. The "rat-tail" type of bronchial obstruction may be seen in patients with bronchogenic cancer.[2] The uniformly narrowed and rigid bronchial tree without terminal arborization has been observed in cases of alveolar cell carcinoma.[3] In chronic bronchitis and pulmonary emphysema, one may note absence of peripheral filling, bronchial "diverticula" originating from dilated mucous glands, and peripheral pooling of the opaque material in dilated bronchioles.[4]

Bronchographic examinations may be performed safely in the majority of tuberculous patients. Among the endobronchial lesions caused by tuberculosis, some are reversible while others are not. Generally speaking, those involving the major bronchi, i.e., submucous tubercles, ulcers, granulomata, compression by enlarged mediastinal lymph nodes, and fistula resulting from perforation of such nodes, are reversible, and they are within reach of the bronchoscope. Changes in the smaller bronchi, i.e., irregularity, dilatation (bronchiectasis) and distortion, are irreversible and are demonstrable only on bronchograms. Bronchography, by disclosing and accurately locating the bronchial damage, is helpful in the selection of therapeutic procedures and in determining the extent of surgical excision in pulmonary tuberculosis.[5]

All methods of investigation have their limitations, and bronchography is no exception. The technique is exacting. The interpretation of findings is not without pitfalls. There are potential hazards in connection with the use of topical anesthetics[6] and contrast media.[1] Nevertheless, bronchography is a useful tool in the study and management of chest diseases when care and caution are practiced.

References

1. Peck, M. E.; Neerken, A. J.; and Salzman, E.: Clinical experience with the water-soluble bronchography compounds. J. Thorac. Surg., 25:234-245, 1953.
2. Robinson, C. L. N., and Peckar, V. G.: The value of bronchography in diagnosing "peripheral" primary lung carcinoma. Brit. J. Tuberc., 50:205-209, 1956.
3. Zheutlin, N.; Lasser, E. C.; and Rigler, L. G.: Bronchographic abnormalities in alveolar cell carcinoma of the lung. Dis. of Chest, 25:542-549, 1954.

(Continued on Page 832)

From Glen Lake Sanatorium, Oak Terrace, Minnesota.

Tumor Conference

Section Editor
Claude Hitchcock, M.D.

Case Study—J.J. (St. Barnabas Hospital)

For twenty years prior to the first hospital admission this fifty-nine-year-old man, in apparent good general health, had noted a cystic lump on the lower aspect of the right wrist about one inch in diameter. The mass remained completely asymptomatic until one year prior to the time of admission when it began to increase rapidly in size and the patient developed pain in the area, especially at night. During September, 1955, the tumor was removed locally and was found to be adherent to three flexor tendons and an artery on the volar aspect of the forearm, but did not involve the skin. Eighty-five grams of tissue measuring 7x6x5 cm. was removed, and the pathologist reported the tumor to be a highly malignant sarcoma with a mucoid quality and a slightly gelatinous consistency. At this time amputation of the arm was recommended but the patient refused.

Immediately following the initial surgery more tumor masses appeared in the area of the operative site, and there was continuing pain and increasing disuse of the hand and forearm. Examination five months after the initial surgery revealed limitation of flexion of the hand to but a few degrees. The tumor involved the volar aspect of the right forearm from the wrist upwards to two-thirds of the distance to the antecubital fossa, and small hard nodules approximately one inch apart were palpated along the basilica vein extending upwards toward the shoulder. Several axillary nodes were palpable on the right side but they were clinically unimpressive. The patient's general physical condition was good at this time and the chest roentgenogram was negative for metastases.

The consensus at the Tumor Conference was that the tumor nodules along the vein represented probable extension of tumor and that probably the lymph nodes were involved. Following the recommendation from the Tumor Conference, the patient submitted to a radical interscapulo-thoracic amputation of the right arm and shoulder.

Examination of the tissue by the pathologist revealed extensive infiltration of the tumor in the region of the forearm from skin down to, and including, the periosteum of the bone. There were extensions in the connective tissue as far proximally as the antecubital fossa. The nodules along the basilica vein were found to be areas of thrombosis, but they did not contain tumor cells. The axillary nodes were negative.

The patient recovered quickly from his surgery and had an entirely benign convalescence. A follow-up examination seven months later revealed satisfactory rehabilitation of the patient and there was no evidence of recurrence of disease.

It cannot be stated categorically that a high percentage of lumps in the regions of joints will ultimately become malignant, but the possibility is always present. Surgical removal of lesions of this kind constitutes the safest approach to the problem. From the pathologic evaluation of this tumor, radical surgery was undoubtedly the therapy of choice. However, the absence of metastases to lymph nodes and the failure to find tumor cells in the veins of the amputated extremity does not in any way assure the absence of occult metastases at this time. In the event that pulmonary metastases develop, recent experience has indicated the advisability of removing metastatic nodules from the lungs of patients with primary cancers of this type as long as the number of nodules does not become excessive. In certain instances, patients have been palliated for as long as ten to twelve years by this means. At this time there is no adequate form of chemotherapy for lesions of this kind. A patient with this problem should be examined every six weeks for a period of several years, and x-ray of the chest should be performed at least every three months.

Case Study—A.F. (Mount Sinai Hospital)

This thirty-eight-year-old, attractive, white married woman has had a ten-year history of difficulty with parotid tumors. Ten years ago a tumor was removed from the left parotid gland and six years ago a more radical operation was performed for a recurrence in the same area.

Four months ago a lump was again noticed by the patient in the region of the left parotid gland and a biopsy of a skin nodule showed this to be a mixed tumor of the parotid gland. Examination revealed the skin over the parotid gland on the left side to be thin and scarred. There was a moderate amount of redness around the incision and some serous drainage was present. The skin contained four distinct nodules measuring up to 1.5 cm. in diameter, and several were palpable in the subcutaneous tissue of the area of involvment. The facial nerve was intact on the left side, and there was no evidence of regional lymph node enlargement.

Since this tumor had already been demonstrated by biopsy to be a benign, mixed tumor of the parotid, a delay was advised between examination and more definitive surgery to permit adequate healing of the biopsy site. Six months after the recurrence had been noted, and two months after the patient was seen in the Tumor Conference, the lesion was excised widely. The incision was made anterior to the ear and posterior to the previously made scars. The facial nerve was identifield posteriorly and the branches were traced anteriorly. A small branch of the facial nerve going to the lower lid on the left side was involved by tumor and was sacrificed. A complete dissection of the area removed the residual parotid gland and the skin immediately overlying the gland, and at this point two masses were palpable in the masseter muscle. These were exposed and removed. A plastic surgical closure of the wound was effected by advancing skin from the neck to close the defect. The patient did not have a facial paresis and the wound healed primarily with good cosmetic result.

The histologic diagnosis of the tissue revealed multiple nodules measuring from 2 mm. to 1.5 cm. in size, composed of tissue characteristic of a mixed tumor of the parotid. Surrounding the tumor masses was normal appearing parotid gland parenchyma. Examination of the individual cells revealed them to be uniform in size and pattern and there was no suggestion of cylindromatous changes. The masses removed from the masseter muscle had similar histology.

The parotid gland is the commonest site of benign mixed tumors accounting for approximately 90 per cent of this type of lesion. Roughly ten per cent of these lesions appear in the submaxillary gland and only about one per cent appear in the sublingual glands. Foote and Frazell recently reported that the largest mixed tumor in the cases from the Memorial Hospital, New York, measured 22 cm. in diameter. However, other authors have reported tumors of the parotid gland as large as seven to twenty-five lbs. Good results are reported following adequate surgical removal of these large benign tumors.

The prime consideration for adequate therapy for lesions of this kind is wide surgical removal, preferably performed as a complete lobectomy of the parotid gland at the time of the first operation. Simple nodulectomy is frequently associated with a high incidence of recurrence of the disease due either to implantation of cells of the mixed tumor in the area of the wound, or to cutting across small tumor extensions beyond the apparent capsule of the nodule. Careful dissection in this area for tumors that are benign rarely gives permanent damage as far as the facial nerve is concerned. Whenever malignancy is present in these nodules, or whenever the benign nodule surrounds and intimately involves a nerve fasicle, that portion of the nerve should be sacrificed. With more patients receiving complete lobectomies of the parotid gland for mixed tumors, the number of cases with recurrent tumor nodules is apparently decreasing.

TREATMENT OF ATRIOVENTRICULAR BLOCK

(Continued from Page 788)

certainly responds to cortisone. Heart block following infarction can well be the result of inflammatory reaction in the areas peripheral to the actual infarct which could be favorably influenced by cortisone. Thorne alludes to adrenal insufficiency playing a role but offers no concrete explanation.

References

1. Prinzmetal, Myron, and Kennamer, Rexford: Emergency treatment of cardiac arrythmias. J.A.M.A., 154:1049-1059 (March 27) 1954.
2. Thorne, G.: Adreno-cortical steroids and ACTH in man. New England J. Med., 248:332, 1953.
3. Nathanson, M. H., and Miller, Harold: Mechanism of syncope and action of drugs in complete heart block. California Med., 76:370 (June) 1952.

ACUTE RECURRENT PANCREATITIS

(Continued from Page 791)

Discussion

Orwood J. Campbell, M.D.: Dr. Nelson has presented an extremely interesting, and, I believe, unusual case. I am in complete accord with his analysis of the mechanism by which this probably occurred. However, I would suggest that we are not likely to see another such chain of symptoms in a very long time.

Pancreatitis is an extremely difficult situation for the surgeon to manage and it is especially so if complicated by an infection. Invasion of the field of necrotic tissue by staphylococci is particularly difficult to handle.

An acute pancreatitis may on occasions result in prolongation of the prothrombin time and it is well to be alerted to this fact in dealing with this disease.

James Myhre, M.D.: Dr. Nelson's careful study and careful presentation are most interesting. The elevation of the alkaline phosphatase value long after the return of the other pancreatic and liver function tests to normal points up some recent authors' observations about this enzyme. They have suggested that the alkaline phosphatase rises as does the serum amylase and lipase, and frequently remains elevated after the latter values have returned to normal. The exact status of this in acute or chronic pancreatitis or pancreatic malignancy remains, however, to be further evaluated.

Editorials

JOHN F. BRIGGS, M.D.
ARTHUR H. WELLS, M.D.
HENRY G. MOEHRING, M.D.

THE DEGENERATIVE COMPLICATIONS OF DIABETES

Before the discovery of insulin, few persons with diabetes of more than moderate severity lived long enough for the degenerative complications of the disease to develop. Now that modern treatment has spared such persons from death due to acidosis or intercurrent infections, these complications are seen more often. One of the major efforts in the field of diabetes today is the study of the degenerative vascular complications, chief of which are retinopathy and nephropathy. A rational approach to prevention and treatment of these lesions is greatly hampered by a lack of knowledge of their cause. Most studies on the subject seem to indicate that duration of diabetes is an important factor in their development and that they are usually worse in younger than in older persons. Great controversy exists as to whether severity and control of the diabetes are primarily concerned with the presence or absence of complications. Although good evidence on these points is difficult to obtain, the most widely accepted view is that the greatest number of advanced complications occur in persons with severe diabetes who have had marked glycosuria for long periods. This view is debatable, since in some patients who have mild and well-controlled diabetes vascular lesions may develop, while in others with severe diabetes in poor control these lesions may not develop. Other factors, including heredity, hyperlipemia and abnormalities of the metabolism of mucopolysaccharides may be important in the causation of the vascular lesions of diabetes, but their exact roles have not been determined.

Treatment of diabetic retinopathy with rutin, vitamin C, hesperidin, and so forth, aimed at decreasing capillary retinal hemorrhage, has been disappointing. Also, roentgen therapy to the affected eyes has been of limited or no value. The knowledge that hypophysectomy ameliorates the diabetes produced in experimental animals, and the report of the disappearance of diabetic retinopathy in a woman in whom Sheehan's syndrome (anterior pituitary insufficiency following postpartum pituitary necrosis) developed have led to the concept that hypophysectomy might improve the vascular complications of diabetes. Likewise, the observation that the administration of cortisone or corticotropin in experimental animals produced retinal and glomerular lesions resembling those seen in human diabetes has prompted other workers to advocate adrenalectomy for treatment of the complications of diabetes. A few such patients have undergone hypophysectomy or adrenalectomy, but the results reported have not been encouraging.

One must conclude that, once the vascular complications of diabetes do develop, there is as yet no effective treatment. At the present time, the only measure which seems likely to delay or prevent the appearance of the complications is careful control of the diabetes, and this should be emphasized to all diabetic patients.

WILLIAM M. McCONAHEY, M.D.

THE NEED FOR HOSPITALS AND RELATED FACILITIES IN MINNESOTA

Minnesota needs approximately 7,500 more nursing home beds to provide adequate facilities for the care of older persons. A nursing home is a private or public medical care facility, supervised by a registered or licensed practical nurse, which should have an affiliation with the community hospital. Personnel of the nursing home should be prepared by training and experience to render, under medical supervision, services based on the total needs of sick, infirm or handicapped persons not in need of hospitalization.

A nursing home which is constructed as a unit or wing of the community hospital or which has a close working relationship with a hospital will have more adequate medical and nursing supervision. Other advantages of this arrangement are the sharing of common facilities such as food service, laundry and heating plant, thereby avoiding duplication. Affiliation of a nursing home with a hospital makes possible the development of a smoothly operating mechanism for referral of patients from one institution to the other. This com-

---

This is the second in a series of editorials on the subject of hospitals and hospital facilities in Minnesota.

bination makes available the type of facility best suited to the need of the individual patient and is an important step in freeing acute, general hospital beds now occupied by long-term patients who do not require hospitalization. It is estimated that ten to twenty per cent of general hospital beds in Minnesota are now occupied by long-term patients who do not need acute hospital care and for whom the acute hospital is usually not geared to provide the ideal type of service.

To help meet this urgent demand, the Hospital Survey and Construction (Hill-Burton) program was amended in July, 1954, to provide federal aid to assist in the construction of nursing homes. However, only 202,379 in Hill-Burton funds has been made available for the first three years of the program, which, on the basis of 45 per cent participation, would assist in constructing only approximately sixty beds. If the full amount as authorized under the act were appropriated, the state could expect to receive a total of approximately $196,348 each year. Since the present funds are so limited, the State Board of Health, which is responsible for the administration of the Hill-Burton program, is giving special consideration to the development of a demonstration project, readily available to a large segment of the population, which will serve as a model to follow in building future nursing homes.

Every possible means must be utilized to stimulate the provision of needed nursing homes as well as homes for the aged and other domiciliary institutions at the local level. Large-state-owned institutions are not the answer to the care of our aged and chronically ill. Considerable discussion has taken place relative to the possibility of the state legislature appropriating a substantial amount to assist local communities—both public and other nonprofit groups—in constructing nursing homes and homes for the aged with infirmary units. A precedent for such action was established in Minnesota in 1913 when state appropriations were made to assist counties in constructing local tuberculosis sanatoria.

The demand for additional beds for the care of the chronically ill and the aged is so great that it will be many years before our needs for facilities and services will be met even though all the groups concerned with this problem extend themselves to the limit.

Helen L. Knudsen, M.D.

THE PRE-MEDICAL STUDENT AND THE MEDICAL SCHOOL

The medical student feels that no one knows the plight of a student studying to enter medical school better than he does. After all, the medical student recently was a pre-med, as these students about to enter medical school are called. He is well aware of the goals of a pre-med, as well as the many pitfalls that lie along the course the pre-med must take to achieve those goals. Most of all, the medical student knows how very little the pre-med really knows about medicine, and especially about medical school.

The Medical Student Council at the University has long been interested in this blind spot in pre-medical work. As the representative organization of medical students at the University, this group is seeking a method of communicating with the pre-meds.

As medical students, we are interested in how to practice medicine. As we get into the clinical years we are glad to have the opportunity to meet with the practitioner who is the attending man in the hospital and clinics. This is a real opportunity for us to find out what the practice of medicine is like. One thing that amazes us is the interest that practitioners have in us, and how eager they are to teach. Our interest in practice leaps higher and higher the more we are exposed to these men.

We are grateful that our medical school does provide this type of information. But we feel that someone is being left out! Namely, the pre-med. Dean Diehl has recently expressed an interest in obtaining more well qualified applicants to medical school. We, too, have the same interest. We remember back to our pre-med days when none of our counselors or instructors had any real affiliation with a medical school. We remember that it was easy to get discouraged, and how appealing other courses seemed where one studied four or five years then went right into a job paying a living wage.

Accordingly, the Medical Student Council has organized an information bureau for pre-meds. We believe medical students can tell pre-meds about medical students just as practitioners tell us about medicine. An office has been provided for us, and now one or two medical students

---

This is the second in a series of editorials concerning the medical student.

spend a few hours a week in a liberal arts building on the University campus to tell any interested student about medical school.

We feel that an information bureau fulfills a real need of the pre-med. We hope that some promising students will thus become more interested in medicine as a career.

Ralph B. Swanson
University of Minnesota Medical School

WHEN DOES THE PHYSICIAN NEED AN ARCHITECT?

On one of his television programs, Arthur Godfrey expessed some of his opinions regarding the effects of cigarette smoking upon the human body. One viewer, who happened to be a medical doctor, wrote a very caustic letter to the famous redhead. The M.D.'s letter concluded by pointing out that the TV star "was violating the law by practicing medicine without a license."

On his next program, Godfrey read the letter from his critic, and then admitted that perhaps he was guilty as the doctor had charged. He dismissed the subject by calling the M.D.'s attention to the fact that perhaps the doctor was guilty of practicing law without a license.

The incident between Godfrey and one of his viewers points up that the members of the various professions are highly sensitive to any kind of an "invasion" of their area of specialized endeavor, but that professional men are not nearly so sensitive about attempting to substitute for the knowledge and skills of another profession.

Mr. and Mrs. John Q. Public have been strongly impressed to "see the dentist" at least twice a year. Certainly, the members of the dental profession are to be congratulated for the success they have attained in this regard. For years the medical profession has advocated regular physical examinations. And this effort has met with worthwhile results.

Architects, however, cannot work on the same kind of public relations program as to "when" a prospective client should consult an architect.

In answer to the question presented in the title of this article, "When Does the Physician Need an Architect?" the answer is really simple. The time to call an architect is just as early in your thinking as you possibly can. There are compelling reasons for an early consultation with an architect and each one of these spells increased service, possible savings at no added service charge to the client.

It should be appreciated that the architect differs from the physician in regard to method of payment. Architectural fees are usually determined on a percentage of the construction cost. Obviously, this percentage fee does not increase if the client retains the services of an architect as early as possible. In fact, architectural counsel during the earliest planning stages often results in important savings for the client.

The client who has the benefit of early architectural aid gets professional assistance on such vital factors as site selection, finances and preliminary estimates. The client is in the position of having everything to gain and nothing to lose by early action in this matter.

There are certain situations where the physician, or any other prospective architectural client, is in an "exploratory" position concerning the advisability of a building project. Even this "exploratory" stage needs the achitect's help. It may be that the "client" would be unwise to proceed with his project. The files of any competent architect contain numbers of cases where the architect has restrained his client from proceeding with a building project which was unwise or unnecessary. Payment for architectural services during the exploratory or preliminary consultation stage can be set on a fixed basis which is usually absorbed within the percentage fee of construction costs if the client proceeds with the project.

In conclusion, it can be simply stated that the doctor requires achitectural help in any building project large or small and he should retain the architect just as soon as it is possible to do so. Any time after that is late, but better late than never!

Robert E. Howe, A.I.A.

THE MINNESOTA HUMAN GENETICS LEAGUE

It is highly unlikely that the Minnesota Human Genetics League would ever have been formed were it not for the bequest of Dr. Charles Dight to the University of Minnesota and the stipulation in his will that a society for the promotion of the science of human genetics be established.

This is the third in a series of editorials on the subject of the architect.

This is the second in a series of editorials on the Minnesota Human Genetics League.

The developments which led to such a unique bequest, and stipulation, make an amazing story.

In 1893, the following circular was distributed: "Your attention is called to the offer made by Dr. C. F. Dight to render medical services by the year. You know beforehand what your doctor's bill for the year is. You know that in case of accident, or long continued illness from any cause, you will have all the medical atention you need without a doctor's bill accumulating. You know that your doctor will not prolong your case from any mercenary motive." Payments were to be made quarterly and ranged from $10 per year for a single person to $25 for a family of four. The world did not flock to his door to accept the offer. Nonetheless, his basic idea of an annual fee for medical care is also the basic idea of Blue Shield and Blue Cross.

The urge to educate the public in matters of health and reproduction resulted in an interesting venture for Dr. Dight during the summer of 1901. He spent that sumer on the Chautauqua circuit lecturing on those topics.

Dr. Dight served from 1914-1918 on the Minneapolis City Council as a Socialist alderman from a Republican ward. He won because he showed that both the Republican and Democratic alderman were dragging their feet on public health matters. He forced a milk pasteurization ordinance through the Council in 1915 over determined opposition from the milk companies. He was instrumental in cleaning up the garbage collection situation and in establishing the present public market. Dr. Dight was a liberal in the best sense, and had little use for many members of the Socialist party, from which he withdrew in 1918.

By 1922, Dr. Dight had decided to dedicate his fortune to the cause of eugenics. He was a real pioneer in the field. When he initiated the eugenics movement in Minnesota, the national and international movements were still in an exploratory stage. Dr. Dight was a part of those organizations. Apparently in 1922 he obtained the help of the dean of the medical school, E. P. Lyon, and Professor Nachtrieb, head of the department of zoology at the University of Minnesota, in forming the Minnesota Eugenics Society which was incorporated in 1925.

The first and only president of the Minnesota Eugenics Society was Charles F. Dight. In 1927, a peak membership of seventy-seven persons would seem to have been a sound basis for continued growth. In this same year, the American Eugenics Society published a list of eugenics lecturers for each state; Dr. Dight and Professor Dwight Minnich were the two Minnesota men listed. Indeed, Dr. Dight had a nationwide reputation in the eugenics field. Yet, by 1930, the Minnesota Eugenics Society had ceased to be active and had faded from the scene.

Why did this occur? The most important reason was probably that to the public the program did not seem urgent, and the early hopes for an immediate improvement of mankind by simple devices, such as sterilization, had foundered. Another reason was that few prominent laymen had been recruited. No social reform will succeed without the backing of some of those who hold the social power. Finally, if an organization is to grow, there must be a paid secretary to handle the details and maintain a tidy administration.

The death of the Minnesota Eugenics Society did not mean that Dr. Dight and his associates had lost heart. It merely meant that a preliminary experiment, for which there had been no model, was completed. A decade later the spirit was to rise again from Dr. Dight's remains, and the Society was to be resurrected.

Sheldon C. Reed
The Dight Institute for Human Genetics

TELEPHONE "GADGETS"

The telephone celebrates its eightieth birthday this year. While its inventor, Alexander Graham Bell, was a man of great vision, and predicted quite accurately some of the improvements that have been made in telephone service, even he would very likely marvel at its many and varied uses today.

From the time of its invention up to the past decade or so, the telephone went through some significant changes, but these were evolutionary rather than revolutionary. Bell's first phone was a box-like instrument through which you both talked and listened. Some years went by, and then the magneto phone, which had a separate earpiece but which you had to crank in order to get the operator, appeared. More time passed, and the common battery telephone which made it

---

This is the second in a series of articles on the telephone.

necessary only to lift the receiver to get the operator was developed. With the advent of switching equipment for automatic completion of calls, telephones with dials were introduced.

These newer type instruments are, of course, a far cry from Bell's first telephone. But until about ten years ago, it seemed to suffice for a customer to be equipped with just one telephone instrument and no more. Then, with more and more emphasis being placed on "modern living," and having everything as handy and convenient as possible, some rather revolutionary changes began taking place—not only in the instrument itself, but in the development of new "gadgets" to meet the needs of modern-day America.

For instance, business or professional men who occasionally had to leave their offices and had no one there to answer the telephone undoubtedly missed some calls—important ones, perhaps. Scientific minds went to work and came up with a device that, when connected to a telephone, can take incoming calls and give the caller a message! It's called the automatic answering device. In response to an incoming ring, the machine answers with a pre-recorded message spoken through the user's own phone, after which it switches itself to a recording position and the caller can leave a message.

Another "gadget" was developed to permit busy Americans to use the telephone and leave both hands free to do other things, and to walk around the room while carrying on a telephone conversation. This one, called the "speakerphone," has a tiny, sensitive microphone in the base of the telephone and a separate speaker. It permits several persons to hear and talk at the same time.

Why not have telephones in cars or other vehicles to permit business or professional people who are on the road a lot to be in constant touch with the office? Radiotelephones were developed in 1947—one of the first revolutionary changes in telephone service.

For those who have to make calls at night, an illuminated dial phone was developed. It has a tiny light over the dial that comes on when the receiver is lifted.

These developments, and many others, came in the very recent past . . . the product of scientific genius applied to an eighty-year-old idea. And who knows what the next eighty years will bring.

NORTHWESTERN BELL TELEPHONE COMPANY

REHABILITATION IN PULMONARY TUBERCULOSIS

Social Effects of the Changing Pattern of Tuberculosis

As a result of super-optimistic articles in the lay and medical press, a large number of the public and too many physicians now think that tuberculosis is on a rapid way out. Be that as it may, they do not realize that a changing pattern of the disease has brought a changing social problem which requires new thinking or prevention.

The natural evolution of the disease has made rarities of acute disease and its complications, such as laryngitis; it has also brought the reappearance of older forms, such as the round focus, and the appearance of new forms in minimal progressive caseating disease and primary adolescent phthisis. This evolution is accompanied by an increasing treatability in our own, native-born populations by the new drugs and antibiotics. The result is a dramatic fall in the death rate; its inevitable corollary, which is too often forgotten, is an increase in the living rate. When we remember that to this result we must add an increasing natural longevity in North America and Western Europe, we have an explanation of the continuing high morbidity in adolescence and early adult life, the increase in senile tuberculosis, and the constantly rising annual additions to the number of the disabled.

Two specific examples of the social implications of the present position are seen in the changed mortality rate of the patient with chronic bilateral disease with cavitation, who now lives for years instead of months, and in the forward shift of tuberculous mortality in males.

As already noted in a former article, domiciliary and clinic treatment are threatening to oust sanatorium treatment. We are in danger of losing the effects of the double duty performed by the sanatorium: on the one hand, its duty to the patient in treatment and in lessons on his aftercare, and on the other, its public health duty in segregation of the infectious and in its teaching on the dangers of contact in home and factory.

The average patient now believes that cure of his disease is synonymous with the rapid disappearance of symptoms and, in particular, with

---

This is the seventh in a series of articles on pulmonary tuberculosis.

the dramatic lessening of sputum that follow antibiotic and drug therapy. Lundquist of Sweden has pointed out the inherent danger of this belief, as long as many of our patients rendered sputum-negative revert to an infectious condition, while many of them remain positive with resistant organisms in spite of long continued treatment. These unfortunate people are a growing danger to our younger populations, especially the children, and we rightly fear another rising incidence of meningitis such as that which followed the closing of sanatoria in England at the outbreak of World War II. Indeed, with a lessening incidence of tuberculin-positive reactors up to adolescence, we must be aware of the dangers of an epidemic spread of the disease in a world that is shrinking in size by improved intercommunication, and concentrating its populations in mass-production factories.

We must not forget a further limitation of all forms of treatment: they cannot replace lost lung parenchyma. Moreover, no matter whether the patient has rest, graduated exercise, collapse therapy, excision, or drugs, he is often left with lessened function far beyond what can be attributed to loss of lung tissue alone. If he is to take his rightful place within the community, he must be taught how to obtain and retain work within the limits of that lessened function, at a rate of pay that will help to maintain his resistance against further breakdown. Rehabilitation and vocational training are now more necessary than ever before. That repetition is the art of teaching is the excuse for saying again that they are an integral part of therapy, which is totally inadequate when directed only at the infecting organism.

R. R. Trail, M.D.
London, England

THE REGISTRY OF MEDICAL TECHNOLOGISTS

Recent strenuous activities by groups aiming at state licensure of medical auxiliary workers are focusing the attention of physicians on the professional and ethical problems presented by the growth of the modern clinical laboratory. Some decades ago, the ASCP (American Society of Clinical Pathologists) founded the Registry of Medical Technologists as the first attempt on a national scale by qualified members of the medical profession to establish acceptable educational, technical and ethical standards for the auxiliary professional services carried out in the laboratories of hospitals throughout the country.

The rapid growth of the field of clinical pathology in breadth, in complexity and in the need for academic preparation of auxiliary workers appears to have outstripped the growth of realization on the part of the medical profession at large of the need for uniform minimum standards and, above all, for an acceptable standardizing body. As a result, the College of American Pathologists, in collaboration with the ASCP and the AMA Council on Medical Education and Hospitals, has found it difficult to fight spurious organizations purporting to examine and "register" laboratory personnel.

This situation is now being complicated by the intensive campaign, waged almost entirely by groups and individuals not qualified by Registry standards, to bring about state licensure of technicians on the terms of such groups, occasionally with the support of nonmedical professional groups, and without reference to the standards set up by qualified medical men within the framework of the AMA and its constituent bodies. The ultimate purpose is that of legitimizing substandard trainees not bound by the code of ethics imposed on individuals who enter this field of service to humanity through the channels established within the medical profession. The long range effect is the loss of qualified medical control and guidance of the clinical laboratory.

Another unhappy effect with vicious circle aspects is the demoralization of bona-fide candidates in medical technology, brought about by the failure of many doctors to distinguish, either by the salaries they offer or by the placing of trust and responsibility, between the individual who has spent several years and much money, under the guidance of qualified doctors, preparing academically and technically for a position in a hospital laboratory, and the individual who has gone from high school to spend a year in a commercial laboratory operated for profit under the auspices of a spurious "certifying" agency, totally outside the control of specialized physicians.

This situation accounts in large measure for the extreme difficulty encountered today in recruiting the right individuals for this type of training. Industry threatens to leave medicine far behind in the competition for potential high-grade scientific workers among our present college student body, unless we become better informed on the issues at stake.

S. Miles Bouton, Jr., M.D.
Director of Laboratories

PHOTOENGRAVING—COLOR PROCESS

We are more conscious today of color in our daily lives than at any time in our history. From the time we rise in the morning until we turn lights off upon retiring, we are constantly surrounded with color—our clothing, our house decorations and our cars, because they too are two or three tone jobs and rarely a solid color as of a few years past. Our offices are done in gayer tones and we are just coming into the use of color in television. The result of this impact of color on our consciousness and thinking causes us to think of its application in our printed literature, so that today our magazines, trades journals and newspapers are full of color. For this reason it is well that we devote a little time discussing how color plates are made, since they will be used more and more as time passes.

We all know that such successful merchandisers as Sears-Roebuck and Montgomery Ward learned years ago that the use of color in their catalogs multiplied their sales many times for the particular items shown in color.

You will recall in our description of the camera operation in a previous article. we said that the screen was placed between the film and lens before the exposure was made.

In making a color process reproduction, we have another operation which must be done previous to this. The copy—a color drawing or transparency—is placed in front of the camera but instead of using the screen in this operation, a filter is placed over the lens to separate the red, yellow, and the blue from each other; in other words, four exposures are made using different filters to get our color separations. These are made without the use of the screen because of its effect on our separations. We now have color separations which are in continuous tone like the original but separated into red, yellow, blue and black. It now is necessary to put these separations on the camera and re-expose them with the screen in place. When we have done this we have screened negatives of each of the separations—yellow, red, blue, and black—which will be printed on metal and developed in the same manner in which a screen negative for a black and white halftone was made, as described in an earlier article.

I should also explain that when the screen negatives are made, the angle of the screen is changed in the camera by rotating it, so that lines of the screen for the yellow are perpendicular, red is 15° to left of perpendicular, blue is 15° right of perpendicular and black is 45°. If this were not done, we would have colors printing one on top of the other with the result that we would get a muddy black in our final printed piece. By printing the dots of varying sizes of each color with small white areas between them, we get the required gradations of color we see in the final reproduction.

Each screen negative is, of course, printed on a separate piece of metal so that we have four printing plates, one for each color, to reproduce our colored picture or transparency, with the proper proportion of color in each to reproduce it faithfully. Since these camera and printing operations are primarily mechanical and do not necessarily select exactly the right amount of color for each component, it is generally necessary for the color etcher to add or subtract color in some areas, very much as was done in black and white, so that when all colors are printed, we have a reproduction of the original which faithfully captures all its gradations of color.

The steps then in making a color reproduction from colored art or transparencies (Kodachromes or Ektachromes) are color separations, screen negatives. printing on metal, etching the engravings and finishing them, which is squaring the engravings accurately, trimming to size, mounting them on wood or metal base for printing and proving or proofing.

I realize that the above description is merely an outline of the methods followed. Each operation consumes many hours of time and years of experience. Making the color separations alone, which is the first operation, takes on an average of five man hours of a skilled operator's time and using cameras and equipment that cost several thousands of dollars.

There are some further operations I have not touched on connected with the photoengraving processes, which I will go into at a later time. I hope that the above has shed some light on one phase of photoengraving.

W. W. Chreiman

President's Letter

SWAN SONG

Yes, this is my last message and I had hoped to make it just a chatty, pleasant farewell, without pleading a cause or exhorting you to action, or any of the other things that seem to need emphasizing at times.

However, as of December 8, 1956, we shall be participating in a new venture: the new Dependents' Medical Care Program. For the first time in our history, we are entering into contracts with a department of the federal government to furnish medical care to a group of people who are not indigents or needy people. This is not welfare work, and services are not to be furnished at any reduced rate, but rather at the usual fees charged in each respective state or area.

The purpose of this act is a worthy one, to help build morale in the armed services. And for that reason, it is well that we participate. But again, this can be just the beginning. Perhaps next year they will ask for the same coverage for all federal employes, then all civil service employes, and so on. This is socialized medicine, but under the present act the patient does have free choice of physicians where a civilian physician can be used, and such physicians are to be compensated by the same fees that are usual in private practice in his area.

Our State Medical Association, as our fiscal agent, is negotiating a contract with the Army, the administrative agent for the Department of Defense, and this contract will contain a maximum fee schedule. In my opinion, we are not interested in knowing the contents of the maximum fee schedule, and I hope that it will be locked up in the archives of the state office.

The Army has been generous in setting up maximum fees, and will use the schedule only as a guide, beyond which it will not go in payment of fees.

We, however, have agreed to furnish this service at our customary fees, and I can assure you that no customary fee in your area will be discounted. All claims will be processed through our state office. There is, perhaps, a temptation where a maximum fee schedule is established, for the vendor of services to submit a fee approaching the maximum.

Minnesota does not have a large military personnel, and the volume of work under this act will not be large, certainly not large enough to justify any attempt to take advantage of the program.

The eyes of the Department of Defense, the Congress and, through them, the nation will be upon us. By our actions shall we be judged. Need I say more?

I cannot conclude this last message without mentioning that the year was saddened for all of us by the loss from our Council within the past two months of two of our councilmen, Dr. H. J. Nilson of the Fourth District and Dr. L. R. Critchfield of the Fifth District. I liked to think of Dr. Nilson as the "great dissenter," a man of firm convictions, extreme devotion to his work on the Council, a man who always spoke his mind, let the chips fall where they might. Every council needs a man like him. Dr. Critchfield was one of the kindliest and most gracious of gentlemen, devoted to his profession and the cause of organized medicine and loving every moment of it. May the souls of the departed rest in peace.

I thank you all again for the great honor and privilege of serving you in my humble way as your president for this fiscal year. While it has been a strenuous year in many respects, it has also been a very pleasant one for me. Everyone has been very kind to me in my travels throughout the state, and I have enjoyed making many new friends.

I especially want to thank the Council and Mr. Rosell and his staff for their kindness, consideration, and assistance. They made it a very pleasant year.

A very Merry Christmas, a most Happy New Year to you all!

R. H. Wilson

President, Minnesota State Medical Association

Medical Economics

Edited by the
Committee on Medical Economics,
Minnesota State Medical Association
George Earl, M.D., Chairman

DEPENDENT MEDICAL CARE PROGRAM GOES INTO EFFECT

Hospitalized spouses and children of Armed Services personnel are now receiving medical and surgical care free from civilian doctors under the provisions of "Medicare," the Dependents' Medical Care Act, signed into law by President Eisenhower six months ago. The program, which went into effect December 7, also provides for diagnostic and "after-care" expenses in the doctor's office. These dependents are required to pay the first $25 or $1.75 per day for hospital expenses (whichever is greater) for as long as they remain hospitalized.

The program in Minnesota is being administered by the Minnesota State Medical Association, which is acting as both the contracting and the fiscal agency. The Association has as its tasks: (1) the negotiation of a fee schedule formulated by the medical profession; (2) arranging for participation of local physicians; (3) receiving, processing and paying medical bills; (4) submitting composite bills for reimbursement by the Department of Defense; (5) helping compile statistics needed for the Department's annual report to Congress on "Medicare," and (6) the mediation of misunderstandings and complaints concerning this plan.

"Medicare" is not a prepayment plan; it is a *post*payment plan, a cost-reimbursement arrangement rather than an insurance arrangement.

In actual practice, the new program should be relatively free of red tape. The "Medicare" patient has merely to present his official identification care to his physician. The doctor, in turn, describes his services on a simple reporting form which is also the claim voucher that he forwards to the Minnesota State Medical Association. Physicians who practice near a large military establishment with ample military hospital facilities are not likely to see many "Medicare" patients, as the law offers them free-choice civilian care only in locales where military facilities are not adequate. Here in Minnesota, no such facilities are available.

It is expected that the government will provide all physicians with copies of the official nomenclature of procedures. Each procedure will be marked with a code number, and the physician will be requested to use this code number in making his claim. As information on the program is forthcoming, it will be passed on to all Minnesota doctors by the State Medical Association office.

PASSAGE OF H.R. 7225 MAKES MORE GOVERNMENT FUNDS AVAILABLE FOR MEDICAL CARE

Another new program involving additional government funds for medical care was made possible by the passage of H.R. 7225 as an amendment to the Social Security law. This program will provide additional funds for medical care of the recipients of the four categories of public assistance, for which federal funds are already available on a matching basis. It will not be available until July 1, 1957, however, and further conferences on the subject will be held.

ELECTION RESULTS AFFECT HEALTH BILLS

Although the November 6 election results will have no profound effect on the course of national health legislation in the new 85th Congress, the turnover in the House and Senate will leave its mark.

The defeat of Rep. Don Hayworth (D., Mich.), all but wiped out the health legislation subcommittee of the Interstate and Foreign Commerce Committee. Chairman J. Percy Priest (D., Tenn), died in October; Rep. F. E. Carlyle (D., N. C.), was defeated for renomination; Rep. Richard W. Hoffman (R., Ill.), was not a candidate for re-election.

Election of Dr. Will Neal from West Virginia's Fourth District puts a fifth M.D. on the House roll. All incumbent M.D.'s were re-elected: Republicans Fenton (Pa.), Judd (Minn.), and Miller (Neb.), and Democrat Morgan (Pa.).

Michigan and New York voters returned to office the two strongest proponents of compulsory national health insurance on Capitol Hill—Reps. John D. Dingell, Jr., and Emanuel Celler, both Democrats.

Rep. Dewey Short (R., Mo.), the veteran Congressman who was responsible for the new law which makes doctors of osteopathy eligible for Medical Corps commissions in the armed forces, went down to defeat. He was ranking minority member of the House Armed Services Committee.

With the Democrats continuing to control Congress, there are expected to be no changes in the chairmen of the committees important to medicine, although there may be some new committee members. Committee chairmen due to retain their posts include Senators Hill, Labor and Public Welfare; Russell, Armed Services; Byrd, Finance; Olin Johnson, Post Office and Civil Service, and McClellan, Government Operations. In the House will be these chairmen: Reps. Harris, Interstate and Foreign Commerce; Cooper, Ways and Means; Teague, Veterans' Affairs; Tom Murray, Post Office and Civil Service; Vinson, Armed Services; and Dawson, House Government Operations.

It is anticipated that there will be campaigns on Capitol Hill for subsidization of voluntary prepayment plans, contributory health insurance for federal employes, construction and operational grants to medical and dental schools, and loan assistance for group practice clinics.

DOCTOR DRAFT TO END JULY 1

The word from Washington is that the Doctor-Draft law, on the books since 1950, will be allowed to expire July 1, 1957. There is one "if"—the law will expire *if* Congress amends the regular Selective Service laws to permit Selective Service to make special calls for persons whose vocational skills are needed by the armed forces. Such special call would include physicians and dentists but not be limited to them. If the armed forces needed engineers, scientists or other skilled personnel, they, too, would be in the same category. It is understood that an amendment to the above effect is now being drafted by the Defense Department for transmittal to Congress in January.

The present situation is this: Although all physicians registered under the regular draft are technically liable for service up to age thirty-five, few, if any, of those over thirty years are likely to be called, since the Defense Department estimates that the majority of its needs can be met by recent graduates of medical schools.

NORTH CENTRAL CONFERENCE REVIEWS MEDICAL ECONOMIC PROBLEMS

The proposed revised principle of medical ethics, the relationship of Blue Shield to organized medicine, the dependents' medical care program and the corporate practice of medicine were discussed by members of the North Central Conference which held its annual meeting in St. Paul, Sunday, November 11.

Revised Principles of Medical Ethics

Dr. Louis A. Buie, Rochester, Mr. C. Joseph Stetler, director of the law department of the American Medical Association, and Dr. C. L. Oppegaard, Crookston, chairman of the Council of the Minnesota State Medical Association, spoke on the proposed revised principles of medical ethics.

Dr. Buie spoke as chairman of the AMA Council on Constitution and By-Laws which, along with the AMA Judicial Council and the AMA Law Department, drew up the revised code at the request of the AMA House of Delegates in June, 1952. The revisions were approved by a reference committee at the June, 1956, AMA session in Chicago, but action was deferred to the Seattle conference. Dr. Buie expressed the purpose of the revised code: to preserve the fundamental principles, but to have them expressed in a more concise, more applicable form, even suitable for a physician to display in his office.

Mr. Stetler discussed the comments received from the various state societies on the proposed revisions and he also outlined the legal aspects of the principles. He said most comments and suggestions for further clarification had come on Sections 3, 6, and 7. He stressed the need for consistent rules of procedure which must be followed when principles are violated, and called for the availability of Judicial Council decisions involving the Principles.

Revised Principles of Medical Ethics

Preamble

These principles are intended to serve physicians, individually or collectively, as a guide to ethical conduct. They are not laws; rather, they are standards by which a physician may determine the propriety of his own conduct. They are intended to aid physicians, in their relationships with patients, with colleagues, with members of allied professions and with the public, to maintain under God, as they have through the ages, the highest moral standards.

Section 1. The prime objective of the medical profession is to render service to humanity with full respect for both the dignity of man and the rights of patients. Physicians must merit the confidence of those entrusted to their care, rendering to each a full measure of service and devotion.

Section 2. Physicians should strive to improve medical knowledge and skill, and should make available the benefits of their professional attainments.

Section 3. A physician should not base his practice on an exclusive dogma or a sectarian system, nor should he associate voluntarily with those who indulge in such practices.

Section 4. The medical profession must be safeguarded against members deficient in moral character and professional competence. Physicians should observe all laws, uphold the dignity and honor of the profession and accept its self-imposed disciplines. They should expose, without hesitation, illegal or unethical conduct of fellow members of the profession.

Section 5. Except in emergencies, a physician may choose whom he will serve. Having undertaken the care of a patient, the physician may not neglect him. Unless he has been discharged, he may discontinue his services only after having given adequate notice. He should not solicit patients.

Section 6. A physician should not dispose of his services under terms or conditions which will interfere with or impair the free and complete exercise of his independent medical judgment and skill or cause deterioration of the quality of medical care.

Section 7. In the practice of medicine a physician should limit the source of his professional income to medical services actually rendered by him to his patient.

Section 8. A physician should seek consultation in doubtful or difficult cases, upon request or when it appears that the quality of medical service may be enhanced thereby.

Section 9. Confidences entrusted to physicians or deficiencies observed in the disposition or character of patients, during the course of medical attendance, should not be revealed except as required by law or unless it becomes necessary in order to protect the health and welfare of the individual or the community.

Section 10. The responsibilities of the physician extend not only to the individual but also to society and demand his co-operation and participation in activities which have as their objective the improvement of the health and welfare of the individual and the community.

Dr. Oppegaard gave the comments and criticisms of the members of the Minnesota State Medical Association on the proposed revisions. Most comments were on Sections 6 and 7. He voiced the fear that a variety of interpretations of the code from state to state would result in confusion, and he suggested Sections 6 and 7 particularly should be enlarged upon so that there would be no danger of a physician's unintentionally jeopardizing himself, ethically and legally.

Dr. Buie thanked the group for their comments and concluded by saying he was not concerned over final action on the proposed revisions at Seattle; he believes it is much more desirable to have a satisfactory, workable system.

Relationship of Blue Shield to Organized Medicine

The discussion on "the relationship of Blue Shield to Organized Medicine" was opened by C. H. Crownhart, Executive Secretary of the State Medical Society of Wisconsin. He mentioned a noticeable lack of co-operation on a national level between the medical profession and Blue Shield plans, but he added he believes the situation is improving. He also stressed the importance of close mutual understanding between plans at the district level and the state medical association involved as no lines can be successfully drawn between *states* in the program.

Dr. R. F. Birge of Des Moines, Iowa, also emphasized the importance of a close relationship between physicians and the Blue Shield program.

He said that Blue Shield and organized medicine in many states have developed conflicting philosophies as to the nature, functions and future objectives of Blue Shield. There has been a concomitant trend of Blue Shield to remain aloof to changing conditions of medical practice, and to become insensitive to the needs of practitioners, particularly to those in non-surgical fields.

To correct the trend in Iowa, an effort was made to establish a two-channel communication between the Iowa State Medical Society and Iowa Blue Shield, with the result that new lines of communication were firmly established providing for interchange of permanent ex-officio memberships between the medical society's Board of Trustees and Blue Shield. Also new methods were adopted for introducing new blood on the Board and of channeling communication, two ways, to the medical society and to members of Blue Shield. Such a close working relationship between Blue Shield and the State Medical Society is absolutely essential, Dr. Birge said. It is the fault of the doctors, themselves, in many instances that Blue Shield plans were set up as corporate entities. Where this has happened, it is somewhat astonishing to find that Blue Shield plans have been set up as self-perpetuating bodies, also, with full privileges for amending their Articles of Incorporation and By-laws without seeking approval of participating physicians. This autonomy of Blue Shield was not the intent or wish of the physicians and, if the trend continues, it is his opinion that the result will be disastrous, for physicians and patients as well as Blue Shield.

Dr. W. E. G. Lancaster, Fargo, North Dakota, said he believed "every doctor should be a member of the Blue Shield corporate body with a view to increasing interest in the plan and that the plan was devised for the benefit of the people and with their welfare at heart." His conclusion was that "Blue Shield is a challenge to every medical man. What it becomes in the future depends on him."

Dependent Medical Care Program

Mr. Stephen E. Gavin, Jr., Madison, Wisconsin, opened the discussion on "Medicare" by giving the purpose of the program: to help make Armed Services careers more attractive. He praised the fine co-operation between medicine and the defense department in working out the details of the program and outlined some of the problems which may come up as the plan is administered.

Dr. J. M. Woodward, Lincoln, Nebraska, further outlined the purposes of the program and also mentioned possible difficulties of administration.

Mr. John Foster, executive secretary of the South Dakota State Medical Association, described how South Dakota would administer its program. He mentioned that the program would be more expensive to administer in the smaller states as the smaller the volume, the higher the cost of administration.

Presidential Address

Dr. P. H. Woutat, Grand Forks, North Dakota, president of the 1956 North Central Conference, gave his presidential address Sunday noon. He outlined the many and varied problems and changes confronting organized medicine and stressed the importance of maintaining the right of the patient to select his own physician.

Dr. Gunnar Gunderson, LaCrosse, Wisconsin, gave a report as chairman of the board of trustees of the American Medical Association. He said it would not be necessary for AMA dues to be raised this year because of the all-time high of advertising revenue for the *JAMA*, the sale of antiquated machinery, and the "farming out" of AMA printing. Dr. Gundersen also urged support of the World Medical Association and of President Eisenhower's "people-to-people" program.

President Woutat presented citations to three founders of the North Central Conference: Dr. William F. Braasch, Rochester; Dr. Stephen Gavin, Fond du Lac, Wisconsin, and Dr. R. L. Parker, Des Moines, Iowa.

Committee Reports

Dr. F. C. Coleman, Des Moines, chairman of the nominating committee for the 1956 Conference, presented these names in nomination: for 1957 president-elect, Dr. R. G. Mayer, Aberdeen, S. D.; for secretary-treasurer, R. R. Rosell, executive secretary of the Minnesota State Medical Association. Both nominations were unanimously accepted. Dr. R. N. Latimer, as 1956 president-elect, automatically becomes 1957 North Central president.

Dr. E. L. Bernhart, Milwaukee, chairman of the resolutions committee, presented the following six resolutions to the group. All met with unanimous approval.

RESOLUTION ON PEOPLE-TO-PEOPLE PROGRAM

Whereas—Friendship between peoples is built on understanding and is nurtured by exchange of information and ideas and by neighborly association, and

Whereas—The international situation presents a new challenge to Americans as individuals, and, through his own efforts and through group action every American can do much to win the friendship of other peoples and in so doing strengthen the cause of freedom and world peace, Be It Therefore

Resolved—That this conference go on record favoring a people-to-people partnership as representing the true spirit behind the principles on which this government was founded.

COMMENDATION FOR THE IOWA STATE MEDICAL SOCIETY

Whereas—The private practice of medicine provides the best system of patient care, and

Whereas—Corporate practice is a threat to the private practice of medicine and is thereby a threat to the high quality of patient care, and

Whereas—The Iowa State Medical Society has successfully defended the private practice of medicine, Now Be It Therefore

Resolved—That the North Central Medical Conference go on record as approving the action of the Iowa State Medical Society in this defence and Be It Further

Resolved—That the North Central Medical Conference commend the Iowa State Medical Society and its members for this effort.

DEPENDENTS MEDICAL CARE PROGRAM

Whereas—The members of the North Central Medical Conference are cognizant of the aims of the Dependents' Medical Care Program which was enacted by Congress and is now being implemented, and

Whereas—The medical profession has already indicated that it will co-operate in every possible way with this program, and

Whereas—We, as doctors, also have the best interests of the dependents of service men at heart and it is nevertheless our opinion that the interests of both these dependents and the medical profession will be served best by adherence to the original position taken by the American Medical Association which called for an additional allotment to be given to the service man to enable him to take care of the medical care needed by his dependents, thus preserving the physician-patient relationship and preserving, also, a responsible individualism with respect to the protection of the health of his family, Be It Therefore

Resolved—That the North Central Medical Conference recommend to the delegates and trustees of the American Medical Association that they continue to urge upon legislative bodies and the Department of Defense the great advantage of an additional allotment to the service man for the purpose of paying for medical care of his dependents as a course which will improve the service man's morale and make more attractive to him a permanent career with the Armed Forces and, Be It Further

Resolved—That this allotment plan would undoubtedly remove the necessity for drafting civilian physicians into the Armed Forces for the purpose of providing medical care for civilians who are dependents of service personnel.

BLUE SHIELD

Whereas—The success of the Blue Shield movement for sound prepaid medical care plans depends on the active participation of the practicing physician, Be It

Resolved—That the Members of the North Central Medical Conference endorse the principle of continued education and participation of all physicians in Blue Shield Plans and Be It Further

Resolved—That every effort must be made to guide, retain or obtain the control by the practicing physician in these plans, this control being mandatory if medically sponsored prepaid plans are to succeed and such control being also in the best interest of both the patient and the physician.

REVISED PRINCIPLES OF MEDICAL ETHICS

Whereas—The members of the North Central Medical Conference endorse the basic principle of simplification for the Principles of Medical Ethics and heartily commend the efforts of the Council on Constitution and By-Laws and the Judicial Council of the American Medical Association for their untiring efforts to this end, and

Whereas—Most of the members of the Association are not familiar with the interpretations and decisions made by the Judicial Council in the past with respect to the Principles of Medical Ethics, and

Whereas—The codification of these interpretations and decisions has not yet been completed, Be It Therefore

Resolved—That final action on simplification and revision be further postponed until the codification now underway has been completed and made available to the members of the American Medical Association.

Legal Considerations

A panel on "legal considerations" devoted its discussion primarily to the subject of the corporate practice of medicine.

Robert B. L. Murphy, Madison, Wisconsin, as panel moderator, explained the history of corporations, their structure, and what they could and could not do by law. He stressed that general law states that corporations may not practice any of the professions.

Mr. Jule M. Hannaford, Minneapolis; Mr. R. B. Throckmorton, Des Moines, and Mr. Karl Goldsmith, Pierre, South Dakota, described problems which their individual states have had in the field of corporate practice.

Mr. Murphy summed up the comments of the members of the panel and concluded that the important criterion was "what is in the best patient interest" in all legal considerations.

Letter to the Editor

To the Editor:

From remarks of several American chest physicians, it is evident that there is much misunderstanding about the present policy of Papworth Village Settlement.

When the Settlement was founded in 1916, sanatorium treatment was the only hope of recovery for the tuberculous. Although the first statistics of its disappointing results were not published by Dr. Noel Bardswell until 1919, Sir Pendrill Varrier-Jones had already realized that it was little more than the half-way house to death for the majority of sufferers from pulmonary tuberculosis, and had concluded that the Settlement provided the only means of continuing the conditions of the sanatorium, under which it was evident that a considerable number of these unfortunate people improved or remained stationary until the date of discharge. His policy was therefore colonization, which meant continued treatment and sheltered employment, for every patient who would accept it.

By the 1930's, however, collapse therapy was producing arrest of disease and fitness for work in normal industry in a growing number of admissions, so that more and more emphasis was thereafter placed on rehabilitation and vocational training combined with treatment as against settlement in the village. This trend was much accelerated after 1948, owing to the general introduction throughout the country of treatment by drugs and antibiotics. The result is that today only some 15 per cent of all those admitted ask for, and require colonization: these are generally bilateral cases with disabling fibrosis or cavitation, or cases with continuing or recurring positive sputum resistant to all known treatment.

The Enham-Alamein Settlement, now run in conjunction with Papworth under a Central Association, was begun as Enham Village Centre in 1918 to provide sheltered living and employment for men with disabilities, other than tuberculosis, which had resulted from World War I. In 1946, it was decided to open one section for men disabled with tuberculosis in World War II. The present policy is to extend the facilities for non-tuberculous, disabled men and women, civilian as well as ex-service; these are sufferers from bronchitis and emphysema, arthritis, paraplegia, poliomyelitis and cardiac conditions, as many such sufferers can be fitted for some self-support in open industry, while the majority need the shelter of the Settlement. It is probable that a similar arrangement will be made for Papworth in the near future.

Richard R. Trail

London, England
October 3, 1956

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

230 Lowry Medical Arts Bldg., Saint Paul 2, Minnesota

F. H. Magney, M.D., Secretary

SOUTH DAKOTA "REFLEXOLOGIST" SENTENCED AT MONTEVIDEO FOR ILLEGAL PRACTICE OF HEALING

Re: State of Minnesota vs. William A. McKay

On August 3, 1956, William A. McKay, fifty-five, 320 Fifth Avenue, S.W., Watertown, South Dakota, entered a plea of guilty before the Hon. C. A. Rolloff, Judge of the District Court at Montevideo, Minnesota, to an information charging him with the crime of practicing healing without having a certificate of registration in the basic sciences, and Judge Rolloff then sentenced McKay to one year in the County Jail of Lac Qui Parle County, the county in which the offense occurred. However, Judge Rolloff stayed the execution of the sentence on the condition that the defendant would be of good behavior and discontinue, in every manner, the practice of healing in the State of Minnesota.

When McKay was questioned in reference to the nature of reflexology, by Judge Rolloff prior to being sentenced, he stated that it consists of massaging the feet of the patient and that the purpose of this is to remove congestion. The defendant said that when he was told that the patient had a specific ailment, he formed a plan of treatment and that for different ailments he would massage different parts of the feet. Although the defendant admitted that he could not explain the theory of reflexology, he stated that he had learned that the nerves in certain parts of the feet related to certain parts of the body. When Judge Rolloff questioned McKay as to what he would do where the patient had a headache over the eyes, he replied that he would then massage the big toe.

McKay, who holds no license to practice any form of healing in the State of Minnesota, was arrested at Boyd, Minnesota, on June 21, 1956, after a criminal complaint, signed by a representative of the Minnesota State Board of Medical Examiners, was filed against him in the Municipal Court in the City of Dawson. The defendant subsequently waived his right to a preliminary hearing in that Court, whereupon he was bound over to the District Court and as stated above entered a plea of guilty. McKay disclosed to the Court that he had been practicing one day out of each week in Boyd since October, 1955, and that he had also practiced one day per week in Clara City, Minnesota. He also stated that ordinarily he saw between twenty-five and thirty patients in each of these towns on the day he spent there, receiving an average payment of $2.00 per patient for his services.

MINNEAPOLIS MAN SENTENCED FOR VIOLATING CITY DRUG ORDINANCE

Re: State of Minnesota vs. Robert P. Selisky

Robert P. Selisky, thirty-two, 2539 Jefferson Street, N.E., Minneapolis, was sentenced on August 28, 1956, by the Hon. Lindsay G. Arthur, Judge of the Municipal Court of the City of Minneapolis, to a term of ninety days in the Minneapolis Workhouse on a charge of violating the city drug ordinance. However, Judge Arthur stayed the execution of the sentence for one year on the condition that the defendant enter the United States Veterans Hospital at St. Cloud, Minnesota, for medical treatment. Selisky did not live up to the terms of the sentence, and on September 7, 1956, Judge Arthur revoked the stay of execution of the sentence, but provided that the defendant should serve eighty days in the workhouse instead of ninety.

The defendant was arrested on August 26, 1956, after a Minneapolis pharmacist had called police two days earlier and reported the license number of a car driven by an individual who had presented a forged prescription calling for dexedrine spansules. The pharmacist had previously received a warning that dexedrine was being obtained from Minneapolis drug stores by means of forged prescriptions of this type.

The defendant has two previous convictions in the Municipal Court of the City of Minneapolis. On December 16, 1952, Judge Dana Nicholson sentenced Selisky to pay a fine of $50.00 or serve twenty days in the workhouse for a violation of the city drug ordinance. The defendant, who had been arrested on this charge on December 13, 1952, paid the fine. On September 2, 1954, Selisky was convicted in Minneapolis Municipal Court on a charge of disorderly conduct and at that time he was sentenced by Judge Lindsay G. Arthur to sixty days in the workhouse. However, the sentence was suspended on the condition that the defendant would go to the Willmar State Hospital and remain there as a patient until discharged. After Selisky was arrested again in Minneapolis on September 18, 1954, Judge Arthur ordered him committed to the Minneapolis Workhouse for sixty days.

SAINT PAUL QUACK COMMITTED TO HASTINGS STATE HOSPITAL AS MENTALLY ILL

Re: Frank Herman Gold

On October 10, 1956, Frank Herman Gold, thirty-nine, 129 W. Summit Avenue, Saint Paul, was committed as a mentally ill person by the Hon. Andrew A. Glenn, Judge of Probate Court of Ramsey County, to the Hastings State Hospital at Hastings, Minnesota. The basis of the petition for Gold's commitment, which was signed by a representative of the Minnesota State Board of Medical Examiners, was a continuous course of conduct over a period of more than ten years by Gold in representing himself as a doctor of medicine with no apparent financial gain to himself. In addition, the petition alleged that Gold had attempted to commit suicide by hanging on the night of September 24, 1956, when he was lodged in jail in Saint Paul.

Gold, who has four convictions in Minnesota for practicing healing without a basic science certificate, was last sentenced on that charge on February 7, 1956, by the Hon. Arthur A. Stewart, Judge of the District Court of Ramsey County, to a term of one year in the Saint Paul Workhouse. Subsequently, the defendant made application to the Court for the suspension of the balance of his sentence, giving as a reason for doing so that arrangements had been made for him to receive psychiatric care from a Saint Paul physician, and on August 1, 1956, Judge Stewart signed an order releasing Gold from the workhouse. On September 24, Gold was arrested again by Saint Paul police after he had examined a woman in Saint Paul, representing to her that he was "Dr. Gerald C. Carter." After Gold attempted to commit suicide that night, it was decided that an attempt would be made to have him committed as mentally ill, rather than again to prosecute him for practicing healing illegally.

(Continued on Page A-39)

Meetings and Announcements

MEDICAL MEETINGS

STATE

MINNESOTA STATE MEDICAL ASSOCIATION, 104th annual meeting, Saint Paul, May 13, 14 and 15, 1957.

Mediclinics of Minnesota, Fort Lauderdale, Florida, March 4-14, 1957. For information write 516 Medical Arts Building, Minneapolis 2, Minnesota.

NATIONAL

American College of Chest Physicians, Council on Postgraduate Medical Education. Postgraduate Courses on Diseases of the Chest. Vanderbilt University, Nashville, Tennessee, January 14-18, 1957; Mark Hopkins Hotel, San Francisco, California, February 25 to March 1. 1957; and Bellevue-Stratford Hotel, Philadelphia, Pennsylvania, April 1-5, 1957. Write Executive Director, American College of Chest Physicians, 112 East Chestnut Street, Chicago 11, Illinois.

American College of Surgeons, sectional meeting, Hotels Lowry and St. Paul, St. Paul, Minnesota, April 8-10, 1957. Write Dr. H. Prather Saunders, Associate Director, American College of Surgeons, 40 East Erie St., Chicago 11, Illinois.

American Congress of Physical Medicine and Rehabilitation, thirty-fifth annual scientific and clinical session, Los Angeles, September 8-13, 1957.

Centennial Exposition, Academy of Medicine of Cincinnati, Health Museum, Cincinnati, Ohio, February 27-March 5, 1957.

Centennial Exposition, 100th anniversary of the Academy of Medicine of Cincinnati, Music Hall, Cincinnati, Ohio, February 27-March 5, 1957.

Chicago Regional Committee on Trauma, American College of Surgeons, course on fractures and other trauma, April 10-13, 1957, John B. Murphy Auditorium, 50 East Erie Street, Chicago, Illinois. Dr. Sam Banks.

College of Medical Evangelists School of Medicine, 1957 Alumni Postgraduate Convention, Los Angeles, California, March 10-14, 1957. Refresher courses, March 10 and 11, giving Category I credit, American Academy of General Practice. Write: Managing Director, Alumni Postgraduate Convention, 316 North Bailey Street, Los Angeles 33, California.

Merrell Symposium on Constructive Medicine in Aging: Cardiovascular Disorders in the Aged, January 17, 1957, Cincinnati, Ohio.

National Resuscitation Society, Inc., course in Clinical Hypoxia, January 4-5, 1957, New York Academy of Sciences. Write Secretary, 2 East 63rd Street, New York 21, New York.

New York University Post-Graduate Medical School. Modern Concepts in the Etiology, Diagnosis and Treatment of Heart Disease; Dr. Charles A. Poindexter, January 7-11, 1957. Clinical Internal Medicine, Thursdays, beginning January 3, 1957, Dr. Charles F. Wilkinson, Jr. Seminar in Dermatology and Syphilology, January 14-18, 1957, Dr. Marion B. Sulzberger. Pediatrics Refresher course, January 14-25, 1957, Dr. Adolph G. DeSanctis. Write: The Dean, NYO Post-Graduate Medical School, 550 First Avenue, New York 16, New York.

INTERNATIONAL

Pan American Congress on Cancer Cytology, Miami, Florida, January 8-12, 1957. Dr. J. Ernest Ayre, chairman, 1155 N. W. 14th St., Miami, Florida.

Pan-Pacific Surgical Association, seventh congress, Honolulu, Hawaii, November 14-22, 1957. Write Dr. F. J. Pinkerton, director-general of the Pan-Pacific Surgical Association, Room 230, Young Building, Honolulu, Hawaii.

EIGHTEEN STATE RADIO STATIONS AIR NEW HEALTH SERIES

"Doctor, Tell Me," the new radio health series cosponsored by the Minnesota State Medical Association, the individual county medical societies and the local radio stations, is now aired over eighteen Minnesota stations. This series, which features Dr. James Rogers Fox, Minneapolis, with both patients and physicians as guests, is produced through the co-operation of KUOM, the University of Minnesota radio station.

The complete schedule in the various Minnesota cities follows. You are urged to listen in each week and to encourage listenership among your patients and friends.

Station	*City*	*Day*	*Hour*
KATE	Albert Lea	Wednesday	7:00 p.m.
KXRA	Alexandria	Thursday	7:00 p.m.
KBUN	Bemidji	Sunday	8:15 p.m.
KLIZ	Brainerd	Saturday	3:45 p.m.
KROX	Crookston	Saturday	9:30 a.m.
KDLM	Detroit Lakes	Sunday	4:15 p.m.
KDAL	Duluth	Sunday	9:05 p.m.
KOZY	Grand Rapids	Saturday	6:30 p.m.
KYSM	Mankato	Friday	9:45 p.m.
KMHL	Marshall	Sunday	5:00 p.m.
KUOM	Minneapolis-St. Paul	Monday	11:15 a.m.
KCUE	Red Wing	Sunday	7:15 p.m.
KROC	Rochester	Sunday	10:15 a.m.
KFAM	St. Cloud	Saturday	9:30 a.m.
WAVM	Stillwater	Sunday	4:30 p.m.
KWLM	Willmar	Sunday	5:30 p.m.
KWNO	Winona	Wednesday	7:00 p.m.
KWOA	Worthington	Sunday	12:30 p.m.

MISSISSIPPI VALLEY MEDICAL SOCIETY ESSAY CONTEST

The attention of physicians is called to the Mississippi Valley Medical Society Annual Essay Contest, which is open to physicians who are members of the AMA and residents and citizens of the United States. Any subject of general medical or surgical interest, including medical economics and education, may be submitted, provided the paper is unpublished and is of interest and applicable value to general practitioners of medicine. Manuscripts must not exceed 5,000 words and must be submitted in five complete copies, in manuscript style. A cash prize of $100, gold medal and certificate of merit will be awarded the winning essay, together with an invitation to the author to address the annual meeting of the Mississippi Valley Medical Society. Essays must be sent to the Secretary, Mississippi Valley Medical Society, not later than May 1, 1957. Winning essays are published each year in the January issue of *Mississippi Valley Medical Journal*. Further information may be secured from Harold Swanberg, M.D., Secretary MVMS, 209-224 W.C.U. Building, Quincy, Illinois.

CONTINUATION COURSES

Medical Continuation Courses will be presented at the Center for Continuation Study, University of Minnesota, as follows:

Jan. 3-5, 1957—Urology for General Physicians

Jan. 7-9, 1957—Dermatology for General Physicians

Jan. 31-Feb. 2, 1957—Emergency Surgery for General Physicians

Feb. 7-9, 1957—Cardiovascular Diseases for General Physicians

Feb. 11-13, 1957—Anesthesiology for General Physicians

Feb. 11-16, 1957—Neurology for General Physicians and Specialists

For further information concerning the above courses, write to the Director, Department of Continuation Medical Education, 1342 Mayo Memorial, University of Minnesota, Minneapolis 14.

JUDD MEMORIAL LECTURE

On February 21 at 8:30 p.m. in the Mayo Auditorium at the University of Minnesota, the Judd Memorial Lecture will be presented. The speaker this year is Sir Philip Allison, Professor of Surgery, Radcliffe Infirmary, Oxford University, Oxford, England. His subject is "Problems of Dysphasia."

LICENSURE EXAMINATION

The next licensure examination by the Minnesota State Board of Medical Examiners will be held beginning on Tuesday, January 22, 1957, continuing on Wednesday, January 23, and concluding with a practical examination on Thursday, January 24.

F. H. Magney, M.D.
Secretary-Treasurer

Woman's Auxiliary

NEWS FROM COUNTY AUXILIARIES

Blue Earth County

The Blue Earth County Medical Auxiliary acted as "hostess" to the members of the Fourth District county auxiliaries including those of Brown, McLeod, Nicollet-Le Sueur, Scott-Carver and Waseca, on Monday, October 22. A luncheon was held at the Altador Tea Rooms in Mankato.

Principal speakers were Harold Brunn, assistant executive secretary of the Minnesota State Medical Association, St. Paul, and Mrs. W. P. Gardner, St. Paul, state legislative chairman for the Auxiliary. Mrs. L. P. Howell, Rochester, state Auxiliary president, was also present. State and national legislative measures concerning medicine were discussed.

Mrs. Alton Lindblom, Mankato, District IV regional adviser, was in charge of general arrangements. Assisting her were Mrs. Chester Thiem, Blue Earth County Auxiliary president, and Mrs. George E. Penn, Blue Earth County Auxiliary legislative chairman and state auditor of the Auxiliary.

Ramsey County

Members of the Woman's Auxiliary to the Ramsey County Medical Society presented a fashion pageant at the 50th anniversary dinner of the Minnesota Tuberculosis and Health Association, October 8, 1956, at Coffman Memorial Union on the University of Minnesota campus.

Modeling of costumes worn from 1906 to 1956 served as a background to show the progress made by medical science in the fight against tuberculosis. The pageant was divided into ten-year periods with the music of each period as interludes.

Organ music was furnished by James O'Brien of the University music department. Mrs. Harold O. Peterson served as chairman of the program, and models were Mrs. Walter A. Carley, Mrs. Frank S. Babb, Mrs. Robert K. Grau and Mrs. Peterson. Children's parts were portrayed by Mary Beth McGroarty, Mary Jo Fogarty, Jane Jernberg and the boys from the North Star Cub Pack 33, Den 2, Roseville. The script was written by Mary Ann Wilcox.

Stearns-Benton County

The Stearns-Benton Auxiliary has published its program for the coming year. The December 20 meeting will be a Christmas program with Mrs. John P. McDowell, Mrs. J. Gelz, Mrs. Thomas Dredge and Mrs. Gilman Goehrs, all of St. Cloud, as hostesses. The Christmas "giving" will be to the Girl Scouts' general fund.

The January 17 meeting will be a Dutch treat at the St. Cloud Hospital. Sister Inez, O.S.B., will speak on the "Aymara Indians of the Andes."

Mrs. J. B. Gaida, St. Cloud, is chairman of the February 5 tea for prospective nurses at The St. Cloud Nurses' Home.

On February 21 the Auxiliary will hold a joint dinner meeting with the members of the Stearns-Benton Medical Society.

The March 21 meeting will be devoted to a civic program either on mental health or juvenile delinquency. Hostesses for this meeting will be Mrs. Leslie Evans, Sauk Rapids, and Mrs. James O'Keefe, Mrs. Otto Phares and Mrs. Richard Jones, St. Cloud.

The Stearns-Benton Auxiliary has forty-three active members and boasts a fine attendance at all meetings. Mrs. K. A. Walfred is president; Mrs. James O'Keefe, vice president; Mrs. C. F. Brigham, recording secretary; Mrs. L. M. Evans, corresponding secretary; Mrs. S. J. Raetz, treasurer, and Mrs. H. F. Reif, author.

"MAGAZINES FOR FRIENDSHIP" PROGRAM

The Woman's Auxiliary to the Park Region District and County Medical Society recently presented a resolution to the State Association Auxiliary board suggesting that the group adopt a "magazines for friendship" project. The Auxiliary adopted this idea and pledged itself to work diligently to make it a success throughout the state.

Mrs. C. E. Carlson, Alexandria, a member of the Park Region group, explains the project in these words:

> Recently I read an editorial in the *Minneapolis Star* called "Cheap Ambassadors" from which I quote:
>
> "Those old magazines piling up in your garage or attic can serve as American ammunition in the battle that is being waged between democracy and communism all over the globe.
>
> "Magazines for friendship, a non-profit corporation in Los Angeles, California, is encouraging Americans to mail their old magazines abroad. They can be shipped to any professor of English at any foreign university or to any mayor or public librarian. You can get lists of specific names as well as instructions from Professor Albert Croissant, Occidental College, Los Angeles.
>
> "Good American magazines which are intended only to inform or entertain can be better advocates of the American way of life than propaganda broadcasts or leaflets. Magazines sent under this program already are being read from Austria to Indonesia and there are reports they are being passed around until they fall apart. They are cheap and effective ambassadors and can provide a badly needed personal touch when shipped direct to a foreign land."
>
> On August 24 I wrote to Professor Croissant for information, and an idea was born!
>
> Why couldn't we send our old copies of *Today's Health* to the four corners of the world? I received an affirmative reply to my suggestion from the Minnesota State Medical Association and from the October 9 meeting of our own state Auxiliary board. All the groups consulted felt it would be a very worthwhile project for the Auxiliary and of real value to our international relations.
>
> Now, why send good magazines abroad? I quote from a letter written recently by the Director of the Catholic Labour Bureau in Ranchi, Bihar, India.
>
> "When the British left India in 1947, they seem to have taken their English magazines with them. There was little left and very little new coming in. All educated Indians do read English because their education has been through this language and, unhappily, good wholesome reading matter is scarce.
>
> "What goes on is the battle for men's minds. No one explains America's point of view. We must come to their rescue. Communist literature is plentiful; they are always on hand with ready poison, insidious, relentless and deadly. Still everywhere I am asked for 'something to read.' Good magazines are quietly and unobtrusively doing the work of healing, of steadying, of information and enlightenment."
>
> We can help fill this void. Our better U. S. magazines are the most vivid, effective propaganda we have. You have plenty of good ammunition in your home every month. Use it! Get on the firing line!
>
> Urge churches, clubs, schools, farm organizations and other groups to send good magazines to key for foreign points. You can send *Newsweek, Time, Reader's Digest, Coronet*—in a slit envelope. It costs only about five cents to mail these directly.
>
> This idea has been endorsed by many prominent authorities at home and abroad—people like Bernard Baruch, Paul Hoffman, John Foster Dulles, Eleanor Roosevelt and leading columnists newspaper and magazine editors. Once people begin receiving appreciative letters from the foreign recipients of their magazines they will preserve their new friendships and develop a lasting interchange. This is no theoretical, untried scheme: it is now in its eighth year.
>
> Let each Auxiliary member help make this project a success in the state of Minnesota!

Contributions for this column including news and activities of State Auxiliary societies and items of interest about members may be sent to Mrs. A. B. Rosenfield, Woman's Auxiliary Editor, MINNESOTA MEDICINE, 2920 Dean Blvd., Minneapolis, Minnesota.

METABOLISM OF MELANIN PIGMENT

(Continued from Page 802)

12. Jeghers, H., and Edwards, E. A.: Pigmentation of the Skin; in Signs and Symptoms, p. 666. London: Staples Press, 1952.
13. Lerner, A. B., and Fitzpatrick, T. B.: Biochemistry of melanin formation. Physiol. Rev., 30:91, 1950.
14. Lerner, A. B.; Schizume, K.; and Fitzpatrick, T. B.: On the mechanism of melanin pigmentation in endocrine disorders. J. Invest. Dermat., 21:337, 1953.
15. Lerner, A. B.; Schizume, K.; and Bunding, I.: The mechanism of endocrine control of melanin pigmentation. J. Clin. Endocrinol., 14:1463, 1954.
16. Monash, S.: Normal pigmentation of the oral mucosa. Arch. Dermat. and Syph., 26:139, 1932.
17. Salassa, R. M.; Albert, A.; Mason, H. L.; Power, M. H.; and Sprague, R. G.: Comparative effects of intermedin and corticotrophin in pituitary insufficiency. Proc. Staff Meet., Mayo Clin., 29:619, 1954.
18. Schizume, K.: Lerner, A. B.; and Fitzpatrick, T. B.: Melanocyte-stimulating hormone in human blood and urine (Abstr.). J. Clin. Endocrinol., 14:789, 1954.
19. Szabo, G.: The number of melanocytes in human epidermis. Brit. M. J., 1:1016, 1954.
20. White, A. G.: Effect of Tyrosine, tryptophane and thiouracil on melanuria. J. Lab. and Clin. Med., 32:1254, 1947.

Medicine and music are universally conceded to be international languages. Perhaps there are many more. The experience of the lawyers compares with our experience as physicians, in that it reveals an unquenchable determination among men of every land and language to assert the dignity of the individual, his inviolable rights to freedom of action, and the subordination of government to those rights.—World M. J., May, 1956.

In Memoriam

LYMAN RAY CRITCHFIELD

Dr. Lyman R. Critchfield, fifth district counselor and past chairman of the Public Health Education Committee of the Minnesota State Medical Association, died October 31, 1956. He was seventy years old.

A native of Hunter, North Dakota, Dr. Critchfield graduated from the University of Minnesota medical school in 1909 and received a degree in pediatrics from Children's Memorial Hospital, Chicago, in 1922.

Dr. Critchfield was a former associate professor of pediatrics at the University of Minnesota, a member of the board of directors of the Minnesota Tuberculosis and Health Association and a member of the governor's advisory committee on mental health. His membership also included the Ramsey County Medical Society, the Minnesota State Medical Association, the American Medical Association and the American Academy of Pediatrics.

Active in civic and fraternal organizations, he was past high priest of the Royal Arch Masons, a member of Osman Temple, Damascus Commandery and the "M" Club, and Phi Rho Sigma, Sigma Xi, and Alpha Omega Alpha fraternities. He also served on the staffs of Ancker, Mounds, Midway and the Gillette State Hospitals, St. Paul.

Survivors include his wife, Irene; four daughters: Mrs. Donald Rock, Arlington, Virginia; Mrs. Forrest Freeman, Hanford, California; Mrs. Kenneth Awsumb, St. Paul, and Mrs. Donald Dunn, Mount Pleasant, Iowa. Also surviving are a sister, Mrs. Kathryn Edwards, Bly, Oregon, and three brothers, Burke and Henry, both of St. Helena, California, and McClaim, Knoxville, Iowa.

RALPH HERTRICH LARSON

Dr. Ralph H. Larson, Anoka physician since 1947, drowned November 16, while on a duck hunting trip. He was forty-one years old.

Born at Breckenridge, Minnesota, June 1, 1915, Dr. Larson received his medical education at the University of Minnesota. He interned at Orange County General Hospital, Orange, California, and spent four years in the United States Army during World War II. He practiced medicine in Cannon Falls before moving to Anoka.

His memberships included the Zion Lutheran Church, Anoka, the Hennepin County Medical Society, the Minnesota State Medical Association, and the American Medical Association.

Survivors are his wife, Bernadette; a son, Charles, Anoka, and his father, Adolph Larson, Glenwood, Minnesota.

H. BRIGHT DORNBLASER

Dr. H. Bright Dornblaser, a Minneapolis obstetrician and gynecologist for many years, died recently in Los Gatos, California. He was seventy years old. A native of Ohio, Dr. Dornblaser graduated from Johns Hopkins University medical school, Baltimore, and served in the army medical corps in World War I. After his army service, he moved to Minneapolis where he practiced for thirty-five years until his retirement two years ago.

He was a life fellow of the American College of Surgeons, a member of the Minnesota Obstetrical and Gynecological Society, the Hennepin County Medical Society, the Minnesota State Medical Association and the American Medical Association.

He also served on the staffs of Abbott, Asbury and Northwestern Hospitals, Minneapolis, and belonged to the Minneapolis Clinical Club.

Dr. Dornblaser is survived by his wife, Hester; one son, Bright M., administrator of the Danbury, Connecticut, hospital, and one daughter, Candace, who is a nurse in San Francisco, California.

FRANK NAEGELI

Dr. Frank Naegeli, a Fergus Falls physician for forty-five years, died on October 22, 1956, of a myocardial infarction. He was eighty-two years of age and very actively engaged in his professional work right up to the time of his death.

Born in Elizabeth Township, Otter Tail County, Minnesota, on December 13, 1873, he graduated from the Northwestern University Medical School in 1910. His internship was spent at the German Evangelical Hospital in Chicago followed by a residency in obstetrics at De Lee's Lying-In Hospital.

Dr. Naegeli was a member of the staff of the Lake Region Hospital in Fergus Falls. He was active in the Kiwanis Club and was a life-time member of the Horticultural Society of Minnesota.

Dr. Naegeli was also a member of the Park Region District and County Medical Society, the Minnesota State Medical Association, and the American Medical Association.

Survivors include his wife, Martha; two daughters, Mrs. Fred (Elizabeth) Page of Oakland Park, Kansas, and Faith, an instructor at the University of Chicago; and two sons, Dr. Frank Naegeli, urologist at the Northwest Clinic in Minot, North Dakota, and Daniel, a student at Carleton College. He also leaves a sister, Mrs. Anna Will of Waseca, Minnesota, and two brothers, Otto, of Duluth, Minnesota, and Joe, of Stockton, California.

BRONCHOGRAPHY IN CHEST DISEASES

(Continued from Page 812)

4. Simon, G., and Galbraith, H. J. B.: Radiology of chronic bronchitis. Lancet, 2:850-853, 1953.
5. Gordon, J.; Zinn, W. B.; and Pratt, P. C.: Bronchography as an aid in planning surgical treatment of pulmonary tuberculosis. J. Thorac. Surg., 22: 109-134, 1951.
6. Doom, S. E.; Waterman, D. H.; Rogers, W. K.; and Cummins, C.: Bronchography with new contrast media. Am. Rev. Tuberc., 74:188-195, 1956.

General Interest

Dr. Nicholas Ryzen has ended his association with the clinic at Clarkfield and has moved to the Pacific Coast. He practiced at Clarkfield for two years.

* * *

Dr. Warren A. Bennett, a member of the staff of the Mayo Clinic since 1944, left Rochester November 1 to become director of laboratories of the Thomas D. Dee Hospital in Ogden, Utah.

* * *

Six new consultants have been appointed to the staff of the Mayo Clinic at Rochester. They are **Dr. R. A. E. Devloo, Dr. A. A. Frethem, Dr. Virginia Hartridge, Dr. J. L. Juergens, Dr. J. A. Spittel, Jr.,** and **Dr. G. F. Starr.**

* * *

A medical center in Israel will be named in honor of **Dr. and Mrs. Moses Barron,** Minneapolis Zionist leaders who organized the Minneapolis chapter of the Friends of the Hebrew University. Dr. Barron served as president of this group from 1930 to 1945. The new consulting and diagnostic center will be built near Tel-Aviv by the Kaput Holim medical system of Histradut and will serve a population of 75,000.

* * *

Dr. John McGroarty, Easton, was awarded the title "Rural Doctor of the Year" by the National Catholic Rural Life Conference in Sioux Falls. Although Dr. McGroatry is seventy-six years of age, he is still active and has practiced medicine in Easton for forty-seven years, being the only physician Easton has ever had.

* * *

A second cobalt radiation unit designed especially for treatment of throat and neck cancer has been installed at University of Minnesota Hospitals, according to **Dr. Donn G. Mosser,** head of radiation therapy. This treatment method will permit a comparatively high dose of radiation with decreased possibility of damage to the skin and normal tissue.

* * *

At the annual dinner dance of Minnesota Medical Alumni Association held in Minneapolis on November 2, **Drs. Malcolm McCannel, Harold Diehl,** and **Vernon Smith** appeared on the program. **Dr. Byron B. Cochrane** of St. Paul is president of the organization, and other officers include **Drs. Virgil Lundquist, Sheldon M. Lagaard, Leonard Borowitz,** and **James Mankey.**

* * *

Congratulations are extended to **Dr. W. C. Heiam** of Cook on his marriage to Mrs. Margaret Savage, also of Cook, on October 6.

* * *

Dr. Frederick Goetz, assistant professor of medicine at the University of Minnesota, served as chairman of the Twin Cities diabetes detection drive November 11 to 17.

* * *

The Scientific Products Foundation award for outstanding service in pathology and medicine was awarded to **Dr. Arthur H. Sanford,** former head of clinical pathology at the Mayo Clinic, during the meeting of the American Society of Clinical Pathologists in Chicago in October. **Drs. David C. Dahlin, Ralph K. Ghormley, Edward D. Henderson** and **Markharm B. Coventry,** also of the Mayo Clinic, were honored with a gold medal for their exhibit on bone tumors.

* * *

Dr. Herman Moersch returned early in October from a two-month trip to Europe, during which he lectured at Edinburgh University, presided at the Fourth International Congress on Diseases of the Chest in Cologne, Germany, and was one of the speakers at the Fifth International Congress of Broncho-Esophagology in Vienna. Dr. Moersch is president of the American College of Chest physicians. During his stay in Germany, the West German government presented him with the Grand Cross of Merit for his services in the field of thoracic diseases.

* * *

In a reorganization of the administrative structure of the Minnesota State Department of Health, two new divisions were created. **Dr. Helen L. Knudsen,** formerly chief of the section of hospital services, has been named director of the newly created division of hospital services, and **Dr. A. B. Rosenfield,** formerly in charge of the section of maternal and child health, is the director of the new division of special services. **Dr. Hilbert Mark** replaces **Dr. Robert N. Barr** as director of the division of local health administration, Dr. Barr becoming the executive officer of the state department.

* * *

Dr. Arthur B. Hunt, head of the section of obstetrics and gynecology at the Mayo Clinic, was installed as president of the Central Association of Obstetricians and Gynecologists at the annual meeting of the association held in New Orleans early in October. Dr. Hunt is professor of the Mayo Foundation and has been secretary and chairman of the section of obstetrics and gynecology of the American Medical Association.

* * *

The city of International Falls turned out in numbers on October 9 to honor **Dr. C. C. Craig** on the occasion of his eightieth birthday. All three of the Craigs' children were present to watch their father receive a plaque engraved with the citation "in appreciation of outstanding service to humanity and the community." In addition to carrying on his medical practice, Dr. Craig has served as alderman and mayor of International Falls.

* * *

Dr. Jack Pierce of the Lenont-Peterson Clinic at Virginia was one of the guest speakers at a meeting of the Obstetrics and Gynecology Society at Dickinson, North Dakota, on October 18. **Dr. Arthur Hunt,** head of the Obstetrics and Gynecology section at the Mayo Clinic, also appeared on the program.

Minnesota Medical Foundation Scholarship Recipients
1956-1957

First Row (left to right): Eugene T. O'Brien, Hopkins (Junior); James R. Thompson, Bemidji (Sophomore); Charles B. Lundquist, Minneapolis (Sophomore); Stephen A. Kieffer, Saint Paul (Sophomore); Barbara Ford, Mankato (Freshman); Wesley W. Spink, President, Minnesota Medical Foundation; LaVonne B. Bergstrom, Wadena (Senior); Gary Baab, New York Mills (Freshman); Charles R. Peterson, Jackson (Freshman); John D. Riley, Stephen (Sophomore); Carl B. Heggestad, Windom (Senior).

Second Row (left to right): Vincent R. Hunt, Anoka (Freshman); Richard A. Meland, Minneapolis (Sophomore); Gerald Ratinov, Minneapolis (Sophomore); Miles I. Lane, Saint Paul (Sophomore); Odean Severseike, Belmond, Iowa (Freshman); Franklin Roller, Rochester (Sophomore); Thomas O. Swallen, Minneapolis (Sophomore); William J. Broussard, Lafayette, Louisiana (Sophomore); George Skaff, Albert Lea (Sophomore); Gordon L. Addington, Saint Paul (Junior); Mark D. Hafermann, Lindstrom (Sophomore); Joseph T. Eckert, Gibbon (Freshman).

On October 1, 1956, the opening day of school at the University of Minnesota, the Minnesota Medical Foundation awarded $10,750 in scholarships to twenty-one medical students, pictured above. Awards were based on both need and scholastic achievement. Mark D. Hafermann received a $750 scholarship, the others $500 scholarships.

Several of the scholarships were specifically contributed by medical organizations in the State: Minnesota Academy of General Practice (John D. Riley); Minneapolis Chapter, American Academy of General Practice (James R. Thompson); Minnesota Academy of Medicine (Thomas O. Swallen); and Minneapolis Guild of Catholic Physicians (Charles B. Lundquist). Other contributors to the Scholarship Fund included: Nicollet-Le Sueur County Medical Society, Minnesota Academy of Ophthalmology and Otolaryngology, Kandiyohi-Swift-Meeker County Medical Society, Minnesota Surgical Society, Minneapolis Society of Internal Medicine, Interstate Clinic of Red Wing, and Nu Sigma Medical Foundation.

The Minnesota Medical Foundation was founded in 1938, incorporated in 1939, by a group of physicians, including members of the faculty of the University of Minnesota Medical School and men in the practice of medicine throughout the State. The purposes of the organization are to promote the cooperation of alumni and friends of the Medical School of the University of Minnesota in improving its undergraduate, graduate, and research functions; to establish scholarships, lectureships, professorships, research, and student loan funds; to publish a medical bulletin; and in general to advance the interests of the Medical School and its alumni. To date, a total of $55,750 in scholarships has been awarded.

In addition, the Foundation supports an annual lectureship for the student body and faculty at the opening of the school year. In conjunction with the annual scientific meeting of the Minnesota State Medical Association, an annual Minnesota Medical Foundation Lecture is presented by a member of the faculty from the Medical School. In this manner, physicians throughout the State have become acquainted with the newly appointed members of the faculty.

The Foundation also supports publication of the *University of Minnesota Medical Bulletin* which is its official publication. The *Bulletin* is sent to all members of the Foundation and has proved to be a valuable liaison between the School and its friends and graduates. Almost sixty medical libraries throughout the country receive the *Bulletin* on a subscription basis. The Foundation's goal is to have every physician in the state a member.

Dr. Howard Rome, head of the psychiatry section of the Mayo Clinic and professor of psychiatry in the Mayo Foundation, has been named a chairman of the Minnesota Department of Public Welfare's mental health medical policy committee. **Dr. Lloyd Merriman** of Duluth is also a member of this committee.

* * *

Among the 234 physicians and their wives from this area who were guests of Parke, Davis & Co. in Detroit, Michigan, October 25 and 26, were **Drs. Malvin Nydahl** and **Lawrence Doyle** of Minneapolis.

* * *

Classes in pediatrics for private duty nurses were held in St. Paul, November 6 and 7, as a project of the Fourth District Minnesota Nurses Association. Among the speakers were **Drs. William R. Heilig, Charles L. Steinberg, Gerald Freeman,** and **Abbott Skinner,** staff members at Children's Hospital, St. Paul.

* * *

"The Nature of Brucellosis" by **Dr. Wesley W. Spink**, scientist, University of Minnesota professor of medicine, and recognized world authority on brucellosis, was published by Minnesota Press on October 15. This volume, which is a compilation of twenty years' research on this disease, centers largely around the work done in Minnesota, whose forward-looking methods of eradication and treatment have been adopted by other states.

* * *

Dr. Leo G. Rigler, head of the department of radiology at the University of Minnesota, was the speaker on October 25 at the organizational meeting in Minneapolis of the Twin Cities Men's group for the City of Hope National Medical Center, Duarte, California.

* * *

At the sixth annual fall refresher course sponsored by the Minnesota Academy of General Practice, **Dr. Claude S. Beck** of Western Reserve University told the 500 physicians present at the St. Paul meeting of his technique of irritating hearts damaged by coronary thrombosis. **Dr. Michael G. Wohl** of the University of Pennsylvania outlined the nutritional and metabolic needs of patients with heart failure, and **Dr. James L. Dennis**, medical director of Children's Hospital, Oakland, California, discussed diarrhea in infants. **Dr. R. L. Page** of St. Charles is president of the Academy.

* * *

At the Fourth Annual Symposium on Antibiotics held in Washington, D. C., October 17 through 19, **Dr. Joseph E. Geraci** of the Mayo Clinic presented a paper outlining the use of vancomycin, a new antibiotic effective against staphylococcus infections. In addition to Dr. Geraci, **Drs. Fordyce R. Heilman, Donald R. Nichols, Williams E. Wellman** and **Griff T. Ross,** also of the Mayo Clinic, have been working with the new antibiotic.

* * *

Dr. Frederick A. Figi, head of the plastic surgery department of the Mayo Clinic, presided at the twenty-fifth annual meeting of the American Society of Plastic and Reconstructive Surgery at Miami Beach, Florida, in October.

The Minnesota Division of the American Cancer Society has selected **Drs. Philip F. Eckman**, Duluth, and **Francis W. Lynch**, St. Paul, as vice presidents for the coming year.

* * *

Dr. James T. Priestley of Rochester was recently elected president of the Society of Clinical Surgeons, an organization for the development and general advancement of surgery including stimulation of surgical teaching. Dr. Priestley is head of a section of general surgery at the Mayo Clinic.

* * *

Community Health Day, sponsored by the women's auxiliaries to the Hennepin County Medical Society, Minneapolis District Dental Society and Minnesota State Pharmaceutical Association, was held in Minneapolis on October 26. **Dr. H. E. Drill**, president of the Hennepin County Medical Society, presided at the morning session.

* * *

Dr. Jan Tillisch of the Mayo Clinic spent part of October and November in Europe on a combined vacation and business trip, which included an address on October 29 at the European Aero-Medical Association meeting at The Hague, Holland.

* * *

The alumni association of Shattuck School presented a citation on October 6 to **Dr. C. Walter Rumpf**, Faribault, for a "distinguished career, community service, and service to Shattuck." Dr. Rumpf, a graduate of Shattuck and the school physician, has practiced medicine in Faribault since 1922.

* * *

At the annual meeting of the American College of Physicians held in Minneapolis, October 27, **Dr. Philip S. Hench**, staff physician at the Mayo Clinic, Nobel prize winner, and regent of the College, was one of seven distinguished guests honored at the banquet held in connection with the fall session. **Dr. Wesley W. Spink,** University of Minnesota professor of medicine and ACP governor for Minnesota, was general chairman of the meeting.

* * *

Dr. Louis L. Friedman, St. Paul, was elected to membership on the board of governors of the Minnesota Obstetrical and Gynecological Society.

* * *

The Minnesota Association for Retarded Children named **Dr. C. W. Rogers,** pediatrician, as Winona chairman for its Friendship Day, November 18.

* * *

Thanks to a device which will be marketed for about $15 early in 1957, heart surgery, now limited to a few medical centers, will be possible in every hospital. An oxygenator made from two sheets of plastic, sealed together with a channel through which blood flows in a stream of oxygen, has been developed and made ready for mass production by **Drs. Richard L. Varco** and **C. Walton Lillehei** and their associates at the University of Minnesota. This device is a refinement of a previous "artificial lung" composed of plastic tubing, developed by **Dr. Richard A. DeWall** and his co-workers.

A Mayo Clinic physician, **Dr. Gershom J. Thompson,** has been decorated by the government of the Dominican Republic for "distinguished services to the republic and to humanity." Dr. Thompson, head of the section of urology at the Mayo Clinic, was presented with the award during a medical symposium held in Cuidad Trujillo in late October.

* * *

A plaque was presented to **Drs. Owen H. Wangensteen** and **Stuart W. Arhelger,** University of Minnesota surgeons, by the American College of Surgeons at their recent San Francisco meeting, in appreciation for their movie on operations for intestinal cancer. Similarly honored was **Dr. B. Marden Black,** head of a section of surgery at the Mayo Clinic, for his work on a film entitled "Left Hemicolectomy for Carcinoma of the Left Transverse Colon."

* * *

The American Board of Plastic Surgery has certified **Dr. T. J. Litzow** of the Mayo Clinic as a diplomate, one of 374 board-qualified plastic surgeons in the United States.

* * *

Among the speakers at the Cancer Education Conference held November 15 in St. Paul were **Drs. James Rogers Fox,** Minneapolis, president of the Minnesota Academy of Occupational Medicine, and **Albert Sullivan,** director, Cancer Detection Center, University of Minnesota. The meeting was sponsored by the Ramsey County unit of the American Cancer Society.

* * *

Dr. E. M. Litin, consultant in psychiatry at the Mayo Clinic, addressed the annual meeting of the North Dakota Mental Health Association in Fargo, on November 1.

* * *

"Clinical Examinations in Neurology," published October 26 by W. B. Saunders Company, is dedicated to two retired physicians of the Mayo Clinic, **Drs. Henry W. Woltman** and **Frederick P. Moersch.** This cooperative work, planned and coordinated by **Dr. Lee M. Eaton,** chairman of the Sections of Neurology and Physiology, was written by members of those sections: **Drs. James A. Bastron, Joe R. Brown, Edward C. Clark, Kendall B. Corbin, David D. Daly, Lee M. Eaton, Norman P. Goldstein, Clark H. Millikan, Donald W. Mulder, Harry Lee Parker, E. Douglas Rooke, Joseph G. Rushton, Robert G. Siekert, Jack P. Whisnant, Reginald G. Bickford,** and **Edward H. Lambert.** The volume is a factual outline of the practical components of the neurologic examination.

* * *

Four physicians from the Mayo Clinic, **Drs. Albert Faulconer, J. S. Lundy, R. T. Patrick,** and **T. H. Seldon** participated in the annual refresher course of the American Society of Anesthesiologists in Kansas City, Missouri, in October.

* * *

The Eleventh Annual Leo G. Rigler Lecture was presented at the Mayo Memorial Auditorium, University of Minnesota, on November 7 by **Professor Hans-Ludwig Kottmeier,** Director of the Gynecological Department of Radiumhemmet, Stockholm, Sweden. His subject was "Clinical Management of Malignancies of the Ovary."

* * *

Dr. Fred Z. Havens, who retired in 1955 as consultant in the Section of Otolaryngology of the Mayo Clinic and associate professor of laryngology of the Mayo Foundation, left Rochester in late October to make his home in Riverside, California.

* * *

Dr. J. R. McDonald, Mayo Clinic, presented a paper at the International Congress on Cancer Cytology in Chicago in late October, and another at a meeting of the Academy of Medicine of Cincinnati and the Cancer Control Council in Cincinnati.

* * *

Minnesota was represented at the National Rehabilitation Association meeting in Denver, Colorado, in October by **Dr. D. J. Erickson** of the Mayo Clinic.

* * *

At the meeting of the American Society of Clinical Pathologists held in Chicago in late October, **Dr. D. C. Dahlin** presented an exhibit, **Dr. D. R. Mathieson** moderated a round table discussion, **Dr. G. G. Stilwell** led a workshop on medical writing, and **Dr. Lyle A. Weed,** presented a paper. These physicians are all members of the staff of the Mayo Clinic.

* * *

A number of Mayo Clinic physicians participated in the Chicago meeting in October of the American Academy of Ophthalmology and Otolaryngology. They are **Drs. O. E. Hallberg, J. W. Henderson, R. W. Hollenhorst, T. P. Kearns, T. J. Kirby, Edith Parkhill, K. M. Simonton,** and **H. L. Williams.**

* * *

Dr. Philip S. Hench, Mayo Clinic, addressed a regional meeting of the American College of Physicians in Tulsa, Oklahoma, in late October.

* * *

Five members of the Mayo Foundation faculty have been appointed to full professorships by the Board of Regents of the University of Minnesota: **Drs. B. M. Black,** surgery; **E. N. Cook,** urology; **W. S. Fowler,** physiology; **H. M. Keith,** pediatrics; and **E. E. Wollaeger,** medicine. The Mayo Foundation is a part of the Graduate School of the University of Minnesota. Nine physicians have been appointed associate professors: **Drs. A. Faulconer,** anesthesiology; **G. A. Hallenbeck,** surgery; **P. R. Lipscomb,** orthopedic surgery; **G. M. Martin,** physical medicine and rehabilitation; **D. R. Nichols** and **Lucian A. Smith,** medicine; **C. A. Owen,** clinical pathology; and **D. G. Pugh,** radiology. The following were promoted to assistant professorships: **Drs. D. S. Childs,** radiology; **E. C. Clark, D. W. Mulder,** and **David Daly,** neurology; **H. W. Dodge,** neurosurgery; **F. H. Ellis,** surgery; **D. J. Erickson,** physical medicine; and **M. H. Stauffer** and **W. E. Wellman,** medicine. **Dr. H. J. C. Swan** was made assistant professor in physiology. A number of physicians received appointments as instructors: **Drs. R. W. P. Achor, J. A. Callahan, F. E. Donoghue,** and **N. O. Hanson,** medicine; **J. A.**

(Continued on Page A-34)

FOR POSITIVE DIURESIS

ROLICTON*

- oral b.i.d. dosage
- continuous control of edema

The new, highly effective oral diuretic, Rolicton, greatly simplifies the task of maintaining an edema-free state in the patient with congestive heart failure. Rolicton meets the criteria for a dependable diuretic: continuous effectiveness, oral administration and clinical safety.

In extensive clinical studies the diuretic response clearly indicates that a majority of patients can be kept edema-free with Rolicton. In these investigations it was noted that side reactions were uncommon. When they did occur they were usually mild.

In most edematous patients Rolicton may be employed as the sole diuretic agent. When used adjunctively in severe cases, Rolicton is also valuable in eliminating the "peaks and valleys" associated with the parenteral administration of mercurial diuretics.

One tablet of Rolicton b.i.d., after meals, is usually adequate for maintenance therapy after the first day's dosage of four tablets. Some patients respond well to one tablet daily. G. D. Searle & Co., Chicago 80, Illinois. Research in the Service of Medicine.

*Trademark of G. D. Searle & Co.

SEARLE

for your
comfort . . .

P&H EXAMINING
STOOL

- Sturdy construction
- Modern design
- Adjustable height
- Well constructed

This stool is built to last. All welded construction. Made of 7/8" gauge tubing. Mounted on 3" ball-bearing swivel casters. Stool is adjustable from 17" to 28". Seat is upholstered in Naugahyde covering of black, brown or gray. Padded foam rubber seat which can be easily removed. Write for more information and price . . . MM-1256a

Physicians & Hospitals Supply Co.
1400 Harmon Place Minneapolis 3, Minn.

(Continued from Page 836)

Bastron, N. P. Goldstein, R. G. Siekert, and **J. P. Whisnant,** neurology; **R. C. Bahn** and **E. R. Soule,** pathology; **P. E. Bernatz,** surgery; **T. J. Kirby,** ophthalmology; **R. A. Smith** and **R. E. Symmonds,** obstetrics and gynecology; **J. C. Lillie,** otolaryngology and rhinology; **J. E. Osborn,** anesthesiology; **H. O. Perry,** dermatology; and **P. W. Scanlon,** radiology.

* * *

The highest honor awarded by the American Heart Association, its Gold Heart Award, was presented on October 28 to **Dr. Arlie R. Barnes,** senior consultant in medicine at the Mayo Clinic. The presentation was made at the heart assocciation's thirty-second annual convention at Cincinnati, Ohio. General Mark W. Clark, national chairman of the heart fund campaign for the past three years. also received an award.

* * *

The Minnesota Heart Association's biennial cardiovascular symposium to be held in September, 1957, will be directed by **Dr. Guy Daugherty** of the Mayo Clinic.

* * *

At the quarterly Fellows banquet of the Mayo Foundation held in Rochester, October 25, **Drs. R. K. Ghormley** and **E. A. Banner** were the principal speakers. Toastmaster was **Dr. R. G. Stevens,** vice president of the Association of Fellows, and short talks were given by **Dr. Thomas Lynn,** president, **Dr. F. H. Rodenbaugh, Dr. Francis Pearce,** and **Dr. L. B. Matthews.**

* * *

A Mayo Clinic and Mayo Foundation scientific exhibit entitled "Ventricular Septal Defect" was awarded third place at the forty-first international scientific assembly at the Interstate Postgraduate Medical Association of North America, held in Cleveland, Ohio, October 22 to 25. The citation read "in recognition of the excellence of teaching material provided physicians in attendance which could be translated into improved care of their patients." Authors of the exhibit are Drs. **Howard B. Burchell, Robert O. Brandenburg, André Brewer, H. G. Harshbarger, James W. DuShane, John W. Kirklin, Earl H. Wood, H. J. C. Swan,** and **Jesse E. Edwards.**

* * *

The U. S. Public Health Service has announced forty-four five-year research fellowship awards to scientists in twenty-nine universities and medical schools in twenty states, the District of Columbia, and Canada. These awards are the first in a new federal program aimed at increasing manpower for research in the basic medical sciences. Recipients are scientists who have completed their doctor's degrees in biochemistry, pharmacology, physiology, microbiology, pathology, and the psychological sciences. Minnesota recipients are **Ellis S. Benson** and **Joel G. Brunson,** both in the department of pathology, University of Minnesota.

* * *

Currently licensed Minnesota registered nurses and licensed practical nurses intending to practice in Minnesota during 1957 must renew their licenses by January 1, 1957. The renewal fee of $1.00 should be sent to the Minnesota Board of Nursing, 700 Minnesota Building, St. Paul 1; there is a penalty fee of $1.00 for renewals postmarked after December 31, 1956. Requests for placement in the nonpracticing status may be made instead of renewal of license by those currently licensed nurses who do not intend to practice in Minnesota during 1957.

* * *

Dr. John C. Mickelson, who expects to complete his residency training in urology at the Presbyterian Hospital in Los Angeles by December 20, will return to practice in the Mankato Clinic where he will follow his specialty.

* * *

Dr. Howard R. Snider of the Mankato Clinic successfully completed his oral examination and is now a member of the American Board of Surgery. Since joining the staff of the clinic in July, 1955, Dr. Snider has limited his practice to general surgery.

* * *

Dr. and Mrs. Volker Goldschmidt, Duluth, are the parents of a son, born September 7.

* * *

Dr. L. A. Barney, Duluth, recently retired from active practice. **Dr. A. N. Collins,** Duluth, who retired a few years ago, was honored at an informal birthday party, September 12, at St. Luke's Hospital.

* * *

Four Duluth physicians, **Drs. J. C. Feuling, S. S. Houkom, W. A. Klein,** and **W. A. Swedberg,** attended a meeting of the Minnesota, Dakota, Manitoba Orthopedic Association at Red Wing in September. Dr. Feuling is president of the organization.

* * *

Dr. Carl O. Rice, Minneapolis, spoke on the subject, "Therapy of Fluid-Electrolyte Problems," on December 5, at the Parenteral Fluid Therapy Symposium sponsored by the Chicago Medical Society and Baxter Laboratories, Morton Grove, Illinois.

* * *

At the November 13 meeting of the Minnesota Society of Neurology and Psychiatry held in St. Paul, Dr. **Ernest Hames, Sr.,** spoke on the "Early History of the Minnesota Society of Neurology and Psychiatry," and **Margaret Bailey, M.D.,** presented her inaugural thesis on "Surgery Among Individuals with Mental Illness."

* * *

"The Concept of Criminal Responsibility" was the subject of a lecture by **Dr. Bernard C. Glueck,** November 19, in St. Paul, under the sponsorship of the Hamm Memorial Psychiatric Clinic and the Hamm Foundation. Dr. Glueck is Associate Professor and Director of Research, Department of Psychiatry, University of Minneosta Medical School. From 1949 to 1955 he served as psychiatrist at Sing Sing Prison, and has written extensively in the field of forensic psychiatry.

* * *

Dr. C. J. Dillenburg has taken over the practice of the late **Dr. Glenn P. Schmitz** at the Broadway Clinic in Little Falls. Dr. Dillenburg is a native of Little Falls and received his medical training at Northwestern University School of Medicine.

slash lubricating costs . . . use

SURGEL LIQUID

AN
ULMER
PRODUCT

Surgel Liquid cuts cost of lubricating jelly materially. No waste often encountered with tube preparations occurs. Every drop can be used. Free-flowing, esthetic in appearance, Surgel Liquid will not clog the dispenser tip. And a very small amount lubricates a large area.

Surgel Liquid is sterile, too. Each batch is autoclaved. And a special "built-in" disinfectant wards off contamination.

A true "money-saver," Surgel Liquid is the choice in many hospitals, clinics and physicians' offices. Write for your trial supply.

Supplied in pints with special dispenser; also gallons.

MM-1256 b

Physicians & Hospitals Supply Co.

1400 Harmon Place Minneapolis 3, Minn.

PROVEN
PAIN CONTROL

with safety

GRADATIONS OF ANALGESIA

'TABLOID' 'EMPIRIN' COMPOUND®
Acetophenetidin gr. 2½, Acetylsalicylic Acid gr. 3½, Caffeine gr. ½

'TABLOID' 'EMPIRIN' COMPOUND
with CODEINE PHOSPHATE gr. ⅛, No. 1 (N)

'TABLOID' 'EMPIRIN' COMPOUND
with CODEINE PHOSPHATE gr. ¼, No. 2 (N)

'TABLOID' 'EMPIRIN' COMPOUND
with CODEINE PHOSPHATE gr. ½, No. 3 (N)

'TABLOID' 'EMPIRIN' COMPOUND
with CODEINE PHOSPHATE gr. 1, No. 4 (N)

(N) subject to Federal Narcotic Law

BURROUGHS WELLCOME & CO. (U.S.A.) INC.
Tuckahoe, N. Y.

Dr. Waldemar C. Rasmussen, Rochester, a member of the Mayo Clinic staff from 1942 to 1955 and an instructor in neurology for the Mayo Foundation from 1943 to 1955, became a consultant in neurology to the Colorado Springs Medical Center, Colorado Springs, Colorado, November 1, 1956.

* * *

Dr. Merrill D. Chesler, Minneapolis, conducted the regional postgraduate seminar held at the Alexandria Clinic, Alexandria, Minnesota, October 25, 1956. His topic was "The Treatment of Burns and Management of Birthmarks in Children."

* * *

Thirteen Minnesota surgeons were among the 1,000 inducted as new fellows of the American College of Surgeons at the October meeting of the group in San Francisco. They were: **Drs. Carl E. Johnson, Thomas T. Myers,** and **Richard E. Symmonds**, Rochester; **Lyle A. Togen**, St. Paul; **Joseph Bloom**, Silver Bay; **Donald H. Honath**, Owatonna; **William F. Andrew**, Duluth, **Lyle J. Hay, John H. Linner, S. R. Maxeiner, Jr., Leonard F. Peltier, Kenath H. Sponsel** and **Bernard Zimmerman**, all of Minneapolis.

Several Rochester physicians were on the surgical clinic program. **Dr. J. T. Priestly** took part in a panel discussion and a televised symposium; **Dr. J. M. Waugh** also participated in a panel discussion and narrated a film. **Drs. D. E. Donald, S. J. Kuykendall, R. J. Jackman, H. D. Ritchie** and **Joseph Berkson** all presented papers. Participating in panel discussions were **Drs. F. Henry Ellis, O. S. Culp, H. W. Schmidt** and **H. J. Svien. Dr. W. H. ReMine** and **Dr. O. H. Beahrs** narrated films. Also attending the conference were **Drs. P. O. Bernatz, C. E. Johnson, T. T. Myers** and **J. H. Grindlay**. All are from Rochester.

* * *

Dr. Moses Barron, Minneapolis, has been reappointed a member of the board of governors of the American Diabetes Association for the 1956-57 organizational year.

* * *

Several Minnesota physicians have been named chairmen of 1957 committees of the Minnesota Heart Association. **Dr. John F. Briggs**, St. Paul, is professional education chairman; **Dr. Milton M. Hurwitz**, St. Paul is chairman of rheumatic fever study; **Dr. Arthur C. Kerkhof** and **Dr. Maurice Visscher**, Minneapolis, are chairmen of the committees on community service and research allocations respectively.

* * *

Dr. Urban H. Zee, Mankato, Minnesota, orthopedist, addressed the members of the Blue Earth Valley Medical Society at their October meeting. His topic was "Injuries to the Hand." **Dr. A. D. Mattson** and **Dr. R. A. Parsons** both of St. James, Minn., were in charge of the program for the meeting.

* * *

Dr. Kathleen Jordan, Granite Falls, was featured speaker at a dinner meeting in Isle, Minnesota, recently. The meeting honored Mille Lacs County for outstanding progress in reducing tuberculosis death and infection rates.

Dr. Herman E. Drill, Hopkins, Minnesota, has been elected president of the Hennepin County Medical Society. He succeeds **Dr. Robert E. Priest**, Minneapolis, who became chairman of the board of the society. Other new officers are **Dr. Karl E. Sandt**, Minneapolis first vice president and **Dr. Wellington W. Rieke**, Wayzata, second vice president. **Dr. Conrad J. Holmberg** was re-elected secretary-treasurer and **Dr. Tague C. Chisholm** was renamed librarian. Both are from Minneapolis.

* * *

The Wabasha County Medical Society elected officers at its 88th annual meeting held in Wabasha October 4, 1956. **Dr. D. G. Mahle**, Plainview, was elected president; **Dr. D. W. Sontag**, Lake City, vice-president, and **Dr. B. A. Flesche**, Lake City, was re-elected secretary-treasurer. **Dr. E. C. Bayley**, Lake City was re-elected delegate to the Minnesota State Medical Association.

Guests at the meeting included **Dr. and Mrs. William Wellman, Dr. J. F. Fairbairn** and **Dr. J. M. Stickney**, Rochester. **Dr. B. J. Bouquet** and **Dr. J. R. Flatt**, both of Wabasha, were featured speakers.

* * *

Nine St. Paul physicians participated in the fall institute of the Minnesota State Bar Association. The purpose of the institute was to acquaint lawyers with the fundamentals of the human anatomy to aid them in cases which require expert medical testimony in damage suit trials.

The physicians and their subjects were: **Dr. Frederick M. Owens, Jr.**, fundamental principles of anatomy; **Dr. Francis W. Lynch**, allergic reactions of the skin; **Dr. Jerome A. Hilger**, problems of facial injuries; **Dr. Bernard Hall**, the contributions and limitations of radiology in medical science; **Dr. Carl C. Chatterton**, injuries to bone and joint structures; **Dr. Donovan L. McCain**, injuries to the spine; **Dr. Wallace P. Ritchie**, organic damage in head injuries; **Dr. Ernest M. Hammes, Jr.**, and **Dr. Gordon R. Kammon**, discussed the neurologic and psychiatric consequences of head injuries.

* * *

Dr. Frank Krusen, Rochester, spoke at the mayor's conference on rehabilitation in Duluth recently. He discussed the relationship between the medical profession and the community-sponsored rehabilitation services.

* * *

Dr. J. Arnold Malmstrom, Virginia, Minnesota, has been elected a member of the board of directors of the First National Bank of Virginia. Dr. Malmstrom is president of the East Range Clinic and is deputy county coroner. He is also a delegate to the Minnesota State Medical Association.

NEW LOCATIONS

Dr. James H. Cain, formerly of Hoffman, has moved his practice to Alexandria, where he will be located in a new building at Twelfth and Broadway.

* * *

Dr. Jack Guy has removed his practice from New London to Sunburg.

PROVEN
PAIN CONTROL

with sedation

GRADATIONS OF ANALGESIA
with light sedation

'EMPIRAL'®

Phenobarbital	gr. ¼
Acetophenetidin	gr. 2½
Acetylsalicylic Acid	gr. 3½

'CODEMPIRAL'® No. 2(N)

Codeine Phosphate	gr. ¼
Phenobarbital	gr. ¼
Acetophenetidin	gr. 2½
Acetylsalicylic Acid	gr. 3½

'CODEMPIRAL'® No. 3(N)

Codeine Phosphate	gr. ½
Phenobarbital	gr. ¼
Acetophenetidin	gr. 2½
Acetylsalicylic Acid	gr. 3½

(N) subject to Federal Narcotic Law

BURROUGHS WELLCOME & CO. (U.S.A.) INC.
Tuckahoe, N. Y.

the Emblems of RELIABLE PROTECTION

We cordially invite your inquiry
for application for membership
which affords protection against
loss of income from accident and
sickness as well as benefits for
hospital expenses for you and
all your dependents.

ALL PREMIUMS COME FROM
PHYSICIANS
SURGEONS
DENTISTS
ALL BENEFITS GO TO

$4,500,000 ASSETS
$24,500,000 PAID FOR BENEFITS
SINCE ORGANIZATION

Since 1902

**PHYSICIANS CASUALTY
AND
HEALTH ASSOCIATIONS**
OMAHA 2, NEBRASKA

Dr. Edward A. Zupanc has left Duluth to establish a practice in Monroe, Wisconsin.

* * *

Dr. Kenneth L. Buresh, who practiced at Westbrook prior to serving in the U. S. Army, has returned to Westbrook and resumed his practice.

MINNESOTA BLUE CROSS-BLUE SHIELD

There's a warm story about Blue Cross . . . a story that until now has never seen print.

It is a story—or a collection of stories—written by Blue Cross subscribers expressing their gratitude to the organization for helping out at time of emergency.

As a community service organization, Minnesota Blue Cross must keep its finger on the public pulse. A method has been devised to do just that. Every tenth hospital case of Blue Cross subscribers is photo-copied and a questionnaire sent to the person. The questionnaire asks the subscribers to comment on the services of the hospital, Blue Cross advantages, and other subjects of interest.

The most revealing area of the questionnaire is the portion devoted to letting the subscriber freely state his personal comments.

When one considers the fact that thousands of Blue Cross claims are administered each month, efficiency must be the keynote. Testimony to this is evidenced by the fact that 100 hospital claims are handled in an hour.

As each questionnaire is returned to the Blue Cross office, it is carefully screened, and if questions are asked that necessitate an answer, they're handled immediately. It is interesting to note, that nearly 99 per cent of the questionnaires are returned.

The unsolicited words of thanks and gratitude break up the routine of normal administration. Such remarks as: "Thank God we had Blue Cross to turn to during our recent emergency," or the young mother who wrote on both sides of the questionnaire to describe in detail an emergency that had occurred involving her four-year-old who had swallowed moth crystals. She closed her questionnaire with the remark, "It was a secure feeling to know that Blue Cross was there when we needed it."

Hundreds of questionnaires are screened each week with little or no unfavorable comment. Employes who read these questionnaires get a "personal lift" from these notes of gratitude, knowing that they are performing a job for which Blue Cross was designed.

Many Minnesotans are today much more aware of the state of their own health and that of their communities as the result of a series of radio programs entitled, "The State of Your Health."

A series of ten "State of Your Health" programs, each featuring prominent authority in the field of public health, has been presented by the Minnesota Department of Health as a public service under the auspices of Minnesota Blue Cross and Blue Shield. Such subjects as "Childhood Diseases," "Mental Health" and "Maternity Care," formed the basis of these general type discussions.

"The State of Your Health" has promoted greater public understanding of some of the public health problems in Minnesota. The programs point out those areas of public health which most need improvements, and emphasize the role of the individual citizen in dealing with health problems—both personal and community.

Before being offered to Minnesota's fifty-five radio stations, "The State of Your Health" was approved by the Minnesota State Medical Association. Minnesota's radio stations were then invited to broadcast the series, and requests were accepted on a basis of priority of requests, since the program was recorded on only twenty individual tapes. "The State of Your Health" has now been broadcast on the first twenty stations to request the series, and many of the remaining thirty-five radio stations have requested the program.

"The State of Your Health" has also been put on film for distribution to colleges, high schools, PTA groups and interested civic groups.

Minnesota Blue Shield and Blue Cross received a citation from the Department of Health for public service for their co-operation in the production and dissemination of this program of health education. Recognition of this outstanding public service was also given by Kiwanis International during the annual Blue Cross-Blue Shield Public Relations Conference of 1956.

SAINT PAUL QUACK COMMITTED

Re: Frank Herman Gold

(Continued from Page 828)

Gold has never studied medicine but was employed for several years as an orderly at a hospital in New York City, and he also worked in the same capacity for at least three hospitals in Minneapolis and Saint Paul. He has three previous convictions in Hennepin County District Court involving violations of the Basic Science Act. Gold was first arrested on May 18, 1946, in Minneapolis for representing himself as a physician and surgeon. He pleaded guilty on May 21, 1946, and on June 12, 1946, was sentenced to a term of one year in the Minneapolis Workhouse. Because it was Gold's first conviction, the sentence was stayed and the defendant placed on probation. In March, 1948, it was learned that Gold was again practicing healing illegally by representing himself as a doctor of medicine. On March 8, 1948, Gold pleaded guilty to the charge and was sentenced by Judge Levi M. Hall to serve one year in the Minneapolis Workhouse. Gold was again arrested on January 14, 1950, and on January 18, 1950, he entered a plea of guilty before the Hon. John A. Weeks, Judge of the District Court, to an information charging him with the crime of practicing healing without a basic science certificate. Judge Weeks sentenced the defendant to serve one year in the Minneapolis Workhouse. At that time Gold had written several prescriptions in which he represented himself as "Dr. Frank H. Gould."

Gold was also convicted in 1951 in Federal District Court in Saint Paul, of several violations of the World War II Servicemen's Readjustment Act of 1944, for illegally obtaining certain benefits under the act and also for making false statements in doing so. On September 4, 1951, Gold was sentenced by the Hon. Robert C. Bell, Judge of Federal District Court in Saint Paul, to pay a fine and also to serve a one year term in prison.

EVERY WOMAN
WHO SUFFERS
IN THE
MENOPAUSE
DESERVES
"PREMARIN"®

widely used
natural, oral
estrogen

AYERST LABORATORIES
New York, N. Y. • Montreal, Canada
5646

PATENTED WEDGE GIVES SUPPORT TO CENTER LINE OF BODY WEIGHT★

★ Insole extension and wedge at inner corner of heel where support is most needed.

- The patented arch support construction is guaranteed not to break down.
- Innersoles guaranteed not to crack or collapse.
- Foot-so-Port lasts designed and the shoe construction engineered with orthopedic advice.
- Conductive Shoes for surgical and operating room personnel. N.B.F.U. specifications.
- We are also the manufacturer of the Gear-Action Shoe designed by noted orthopedic surgeon.
- We make more shoes for polio, club feet and disabled feet than any other shoe manufacturer.

Send for free booklet, "The Preservation of the Function of the Foot Balancing and Synchronizing the Shoe with the Foot."

Write for details or contact your local **FOOT-SO-PORT** *Shoe Agency. Refer to your Classified Directory*

Foot-so-Port Shoe Company, Oconomowoc, Wis.
A Division of Musebeck Shoe Company

organomercurial diuretics "...permit ingestion of enough salt to make food palatable; without them, many patients would lose their appetites, a consequence of the salt-free diet which has occasionally been known to cause serious malnutrition."*

*Modell, W.: The Relief of Symptoms, Philadelphia, W. B. Saunders Company, 1955, pp. 265-266.

03156

Brown & Day, Inc.

Your Patients Deserve

The Finest

FOLDING WHEEL CHAIRS

and

WALKERS

—and that means

Everest and Jennings

Made for greatest comfort, dependability and riding ease—fully guaranteed.

Let Us Send You An Illustrated Catalog

"Everything for the Physician"

for fast service call CA 2-1845

SERVICE BROWN & DAY INC SAINT PAUL U.S.A. QUALITY

62-64 EAST 5TH ST
St. Paul 1, Minn.

Malpractice Prophylaxis

With us "know-how" in prevention, defense and negotiation reduces the filing of malpractice claims and suits

Specialized Service makes our doctor safer

THE MEDICAL PROTECTIVE COMPANY
FORT WAYNE, INDIANA

Professional Protection Exclusively since 1899

MINNEAPOLIS Office:
Robert L. McFerran, Rep.
311 East 24th St., Apt. A-1
Telephone Federal 9-1292

specify

Lederle

POLIOMYELITIS IMMUNE GLOBULIN

(human)

For the modification of measles and the prevention or attenuation of infectious hepatitis and poliomyelitis.

LEDERLE LABORATORIES DIVISION
AMERICAN Cyanamid COMPANY
PEARL RIVER, NEW YORK

Cook County Graduate School of Medicine

INTENSIVE POSTGRADUATE COURSES
STARTING DATES—WINTER, 1956-1957

SURGERY—Surgical Technic, two weeks, December 10, January 28
- Surgery of Colon and Rectum, one week, March 4
- General Surgery, one week, February 11
- General Surgery, two weeks, April 23
- Surgical Anatomy and Clinical Surgery, two weeks, March 4
- Surgical Pathology, two or four weeks, by appointment
- Basic Principles in General Surgery, two weeks, January 14
- Fractures and Traumatic Surgery, two weeks, March 11
- Anesthesia, two or four weeks, by appointment

GYNECOLOGY & OBSTETRICS—Office and Operative Gynecology, two weeks, February 11
- Vaginal Approach to Pelvic Surgery, one week, February 4
- General and Surgical Obstetrics, two weeks, February 25

MEDICINE—Electrocardiography and Heart Disease, two-week basic course, March 11
- Gastroenterology, two weeks, May 13
- Dermatology, two weeks, May 6
- Gastroscopy, two weeks, March 18

RADIOLOGY—Diagnostic X-ray, two weeks, February 4
- Clinical Uses of Radioisotopes, two weeks, May 6

UROLOGY—Two-week Course April 1
- Cystoscopy, ten days, by appointment

TEACHING FACULTY—ATTENDING STAFF OF COOK COUNTY HOSPITAL

ADDRESS: REGISTRAR, 707 South Wood Street, Chicago 12, Illinois

---

GLYCAMINE®

TABLETS

For Peptic Ulcers and Hyperacidity

Available All Drug Stores

Distributed by
DALCO PHARMACAL CO.
Minneapolis, Minnesota

RADIUM

(Including Radium Applicators)
FOR ALL MEDICAL PURPOSES
Est. 1919

Quincy X-Ray and Radium Laboratories

(Owned and Directed by a Physician-Radiologist)

HAROLD SWANBERG, B.S., M.D.
Director

W. C. U. Bldg. Quincy, Illinois

ORTHOPEDIC APPLIANCES

Skill and care combine with quality materials in all Buchstein-Medcalf orthopedic appliances. Our workmanship and scientific design conform to the most exacting professional specifications. Accepted and appreciated by physicians and their patients for more than 45 years.

ARTIFICIAL LIMBS, TRUSSES
SUPPORTERS, ELASTIC HOSIERY

Prompt, painstaking service

Buchstein-Medcalf Co.

223 So. 6th St. Minneapolis 2, Minn.

THE BANK WHERE YOU FEEL AT HOME

the AMERICAN
NATIONAL BANK OF SAINT PAUL
MEMBER FEDERAL DEPOSIT INSURANCE CORPORATION

Classified Advertising

Replies to advertisements with key numbers should be mailed in care of MINNESOTA MEDICINE *2642 University Avenue, Saint Paul 14, Minnesota.*

PHYSICIAN NEEDED—In county seat town of 1800, located in excellent farming community, Central Minnesota. No other physician within 35-mile radius. New 25-bed hospital planned. Good schools and housing. Office available. Address Kenneth Mattson, Mahnomen, Minnesota.

LARGE NATIONALLY KNOWN INDUSTRIAL CONCERN has opening for general practitioner, recent medical graduate, or one desiring to enter the industrial field. Complete modern Medical Department, no Saturday or Sunday work, paid holidays, vacations, sick leave and pension plan. Fine opportunity for right man in town of 18,000, near Twin Cities. Address E-556, care MINNESOTA MEDICINE.

WANTED—General Practitioner for clinic in town of 7,000 to work with two other general practitioners. 200-bed general hospital 4 miles away. Full partnership offered after one year with eleven-man partnership which operates two other clinics in area. Contact East Range Clinic, Eveleth, Minnesota.

"...THE MERCURIALS HAVE PROLONGED THE WORKING PERIOD AND LIFE SPAN OF COUNTLESS SUFFERERS FROM CONGESTIVE HEART FAILURE..."*

TABLET
NEOHYDRIN®

*Fishberg, A. M.: Hypertension and Nephritis, ed. 5, Philadelphia, Lea & Febiger, 1954, pp. 177-178.

00756

PHYSICIAN WANTED—In town located in excellent farming and trading community, to take over active large practice which has been established over 20 years. New community hospital to be erected next year. Hospital facilities now available in town. Office well equipped, ground floor. Address E-558, care MINNESOTA MEDICINE.

WANTED—Associate with training in Internal Medicine to replace doctor leaving for military service. Remuneration satisfactory. Address E-562, care MINNESOTA MEDICINE.

WANTED—Qualified General Practitioner. Minnesota. Excellent hospital facilities. Unusual opportunity for the right man. Address E-559, care MINNESOTA MEDICINE.

WANTED—Practical nurse to take over nursing in office, and do simple laboratory procedures. If interested, address E-561, care MINNESOTA MEDICINE.

FOR SALE—General Practice, with emphasis on surgery, in county seat town of 3,000. Excellent hospital. Net collections nearly $30,000 a year. Address E-560, care MINNESOTA MEDICINE.

FOR RENT—Suite of seven rooms, especially designed for physician's use located at 2723 East 38th Street, Minneapolis. Occupied by M.D. past eleven years. Write or call H. A. Lindberg, 3925 28th Avenue South, Minneapolis 6, PArkway 2-0002.

FOR RENT—Highland Shopping Area, partially equipped office available, full or part time. Excellent for general practice, obstetrics, pediatrics. No rent until established. Address H. Schwyzer, M.D., 530 Lowry Medical Arts Building, Saint Paul 2, Minnesota. Telephone: CA 4-7416.

FOR RENT OR SALE—Eight-room, first-floor physician's office. Well equipped. Near Twin Cities. Gross over $30,000. New hospital—unlimited privileges. Good opportunity. Write E-511, care MINNESOTA MEDICINE.

RADIUM RENTAL SERVICE
4340 CEDARWOOD ROAD
MINNEAPOLIS 5, MINNESOTA
TEL. FE 3-5297

Radium element prepared in type of applicator requested

ORDER BY TELEPHONE OR MAIL
PRICES ON REQUEST

The Birches Sanitarium, Inc.
2391 Woodland Avenue
Duluth 3, Minnesota

A hospital for the care and treatment of Nervous and Mental disorders. Quiet, cheerful environment. Specially trained personnel. Recreational and occupational therapy.

Dr. L. R. Gowan, M.D., M.S., Medical Director

DANIELSON MEDICAL ARTS PHARMACY, INC.

PHONES:
FEderal 3-3317
FEderal 3-3318

10-14 Arcade, Medical Arts Building
825 Nicollet Avenue—Two Entrances—78 South Ninth Street
MINNEAPOLIS

HOURS:
WEEK DAYS—8 to 7
SUN. & HOL.—10 to 1

Index to Advertisers

Abbott Laboratories A-20, A-21
Aloe, A. S., Co. A-16
American National Bank of St. Paul A-41
Ames Co., Inc. ....Cover III
Ayerst Laboratories A-39

Benson Optical Co. A-44
Birches Sanitarium, Inc. A-43
Brown & Day, Inc. A-40
Buchstein-Medcalf Co. A-41
Burroughs Wellcome & Co. A-10, A-36, A-37

Caswell-Ross Agency 794-A
Chicago Medical Society 794-D
Ciba A-16
Classified Advertising A-42
Coca-Cola A-26
Cook County Graduate School of Medicine....A-41
Corn Products Refining Co. A-14

Dalco Pharmacal Co. A-41
Danielson Medical Arts Pharmacy, Inc. A-43
Druggists Mutual Insurance Co. A-43

Foot-so-Port Shoe Co. A-40

Hoffmann-La Roche....Facing page A-16

Lakeside Laboratories A-17, A-40, A-42

Lederle Laboratories A-25, 794-B, 794-C, A-41
Lilly, Eli, & Co....Cover I, A-32

Medical Protective Co. A-40
Merck Sharp & Dohme A-8, A-9, A-15, A-18, A-19, A-27

New Orleans Graduate Medical Assembly 794-D

Parke, Davis & Co....Cover II, A-1, A-22, A-23
Pfizer Laboratories, Div. of Chas. Pfizer & Co. A-12, A-13, A-28, A-29
Physicians Casualty and Health Associations A-38
Physicians & Hospitals Supply Co. A-34, A-35

Radium Rental Service A-42
Riker Laboratories A-11

Quincy X-Ray and Radium Laboratories A-41

St. Croixdale Sanitarium A-26
Schering Corporation A-30, A-31
Searle, G. D., & Co. A-33
Smith, Kline & French Laboratories ....Cover IV
Sutliff & Case Co., Inc. A-44

Trautman, Ray, & Son A-24

Upjohn Co. A-7

Viceroy Cigarettes A-6

Wallace Laboratories A-5
Winthrop Laboratories A-4, A-24

Insurance at a Saving

Druggists' Mutual Insurance Company
OF IOWA, ALGONA, IOWA
Fire - Tornado - Automobile Insurance

Prompt Loss Service

MINNESOTA REPRESENTATIVE—S. E. STRUBLE, WYOMING, MINN.

For complete gall bladder regimen...

Colicell

A single COLICELL tablet is more effective for a longer period and is carefully coated to prevent gastric disturbance. In bottles of 100 and 1000 tablets.

SAMPLES AND LITERATURE ON REQUEST

SUTLIFF & CASE COMPANY, INC.

Pharmaceutical Specialties • PEORIA, ILLINOIS

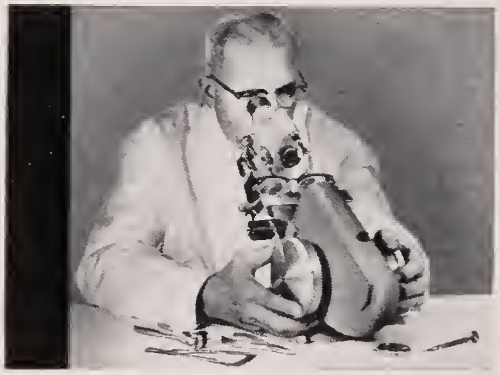
SINCE 1883

Each Tite-Coat Red Tablet Contains:

Extracts of Whole Bile (Equal parts Ox and Hog)	210.0 mg.
Ketocholonic Acids (Oxidized or keto form of normally occurring bile acids containing approximately 93% dehydrocholic acid)	90.0 mg.
Methyl Cellulose	130.0 mg.
Homotropine Methylbromide	2.5 mg.

Staffed to serve you better /

when you send your ℞ to Benson's hundreds of **optical craftsmen** assure you of quality service



On your next ℞, try BENSON'S — *dedicated to provide unexcelled ℞ service to the ophthalmic profession since 1913*

Yes, one of the resources at your disposal at BENSON'S is the experience and skill of our optical craftsmen.

And, coupled with this know-how is what we call *"Quality-Desire."*

These outstanding technicians have the desire to excel — to do each operation just a little better than normally required. This extra attention to details on *every* ℞ spells *Quality* for you.

This quality service is yours with no slow-down in delivery. BENSON'S is staffed and equipped to handle its volume of prescription service with optimum efficiency — and doing the job right the first time eliminates costly and time-consuming re-works.

Benson
OPTICAL COMPANY

Executive Offices • Minneapolis 2, Minn.

COMPLETE LABORATORIES CONVENIENTLY LOCATED IN UPPER MIDWEST CITIES

Index to Volume 39

A

Abscess of the tongue, 597
Accidental gunshot wounds, 159
Accident prevention, Home, 214
Accidents, farm, Children and, 529
Accidents of children, 392
ACTH and cortisone in agranulocytosis, 454
Activities of the Sears, Roebuck Foundation, 532
Acute cholecystitis and choledocholithiasis, 675
Acute infectious hepatitis: laboratory aids in management, 37
Acute recurrent pancreatitis, 789
Adenocarcinoma of the appendix, Primary, associated with a "Krukenberg tumor," 536
Agranulocytosis, ACTH and cortisone in, 454
Agranulocytosis and jaundice, Chlorpromazine therapy complicated by 740
Alimentary tract, Obstruction of the, in the neonatal period, 265
Amebiasis, 69
Anderson, David P.: Medicine in southern Minnesota, 165
Anderson, Ray C.: Genetic and familial aspects of central nervous conditions in children, 112
Anesthesia for emergency surgery, 803
Anesthesia, topical urethral, Xylocaine jelly for, 517
Aneurysm, Renal artery, causing malignant hypertension, 671
Anticoagulant therapy, prolonged, The value of, 39
Appendix, Primary adenocarcinoma of the, associated with a "Krukenberg tumor," 536
Arterial embolism, Peripheral, 475
Arteriography as an aid to diagnosis, 378
Arteriosclerosis obliterans, Present concept of the treatment of, 203
Arteriosclerosis of the major vessels, The role of surgery in the treatment of, 703
Arteriovenous communications, Congenital peripheral, 389
Artery homografts, Reconstruction of major blood vessels employing, 638
Asthma, Study of 200 consecutive patients hospitalized for, 20
Atmore, William G., Dahlin, David C., and Ghormley, Ralph K.: Pigmented villonodular synovitis, 196
Atrioventricular block, Treatment of, 787
Aust, J. Bradley, and Varco, Richard L.: Biliary stricture, 189
Automotive crash injury research program, Minnesota, 457

American Medical Association

Proceedings of the House of Delegates, June 11-15, 1956, 559

B

Balogh, Charles J., and Laymon, Carl W.: The use of liquid oxygen in dermatology, 151
Balogh, Charles J., and Laymon, Carl W.: Treatment of cutaneous scars by dermabrasion, 524
Banti's syndrome, 28
Bargen, J. Arnold: Activities of the Sears, Roebuck Foundation, 532
Bargen, J. Arnold: Amebiasis, 69
Barker, Nelson W.: Diagnosis and treatment of thromboangiitis obliterans (Buerger's Disease), 303
Barnard, C. N., and Louw, J. H.: The genesis of intestinal atresia, 745
Baronofsky, Ivan D., Tongen, Lyle, Connolly, Coleman, Lewis, F. John, and Reeves, Melvin M.: Resectional surgery for pulmonary tuberculosis, 577
Bergh, George S.: Acute cholecystitis and choledocholithiasis, 675
Berglund, Eldon, Thompson, Willis H., and Chisholm, Tague C.: Familial absence of mesenteric *(correction,* myenteric) plexus as a cause of bowel obstruction in the newborn, 447
Bernatz, Philip E., Dushane, James W., and Kirklin, John W.: Surgical treatment of certain congenital cardiovascular abnormalities in infants and children, 1
Biliary stricture, 189
Bleeding, gastrointestinal, Massive upper, 94
Blood and plasma expanders, The use of, during the third trimester of pregnancy, 87
Blood vessels, major, Reconstruction of, employing artery homografts, 638
Blumenthal, J. S.: ACTH and cortisone in agranulocytosis, 454
Bofenkamp, Benjamin J.: The various mechanisms of suffocation in poliomyelitis, 761
Borg, Joseph F.: The value of prolonged anticoagulant therapy, 39
Bourne, Geoffrey: Functional heart disease, 545
Bourne, Geoffrey: Functional heart pain, 677
Bourne, Geoffrey: Functional manifestations in organic cardiovascular disease, 744
Bourne, Geoffrey: Physical signs of functional heart disease, 617
Bowel obstruction in the newborn, Familial absence of mesenteric *(correction,* myenteric) plexus as a cause of, 447
Bowel, small, Leiomyosarcoma of the, 710
Bowers, Dorrance: Congenital hemihypertrophy and hemihypoplasia, 461
Breast cancer, advanced, Hormonal treatment of, 76
Bronchogenic carcinoma with unusual presenting symptoms, 462
Bronchography in chest diseases, 812

Book Reviews

Alvarez, Walter C.: Nervousness, indigestion and pain, (April) A-38
American College of Surgeons, Committee on Trauma: An outline of the treatment of fractures, (May) A-39
American College of Surgeons, Committee on Trauma: Early care of acute soft tissue injuries, (May) A-39
American Medical Association, Committee on Medical Motion Pictures: Reviews of medical motion pictures, (May) A-39
American Society of Mechanical Engineers: American Standard National Plumbing code, (May) A-39
Andrews, Gould A.: Radioisotopes in medicine, (July) A-32
Behrman, Howard T.: The scalp in health and disease, (September) A-43
Cutolo, Salvatore R., with Gelb, Arthur and Barbara: Bellevue is my home, (August) A-38
Ellinger, Tage U. H.: Hippocrates on intercourse and pregnancy, (March) A-38
Gray, Madeline: The changing years, (July) A-33
Lown, Bernard, and Levine, Samuel A.: Current concepts in digitalis therapy, (July) A-34
Pottenger, Francis Marion: The fight against tuberculosis; an autobiography, (February) A-40
Silver, Henry K., Kemp, C. Henry, and Bruyn, Henry B.: Handbook of pediatrics, (April) A-39
Standard, Samuel (editor): Should the patient know the truth? (January) A-38
Welt, Louis G.: Clinical disorders of hydration and acid-base equilibrium, (January) A-48
Winslow, Walker: The Menninger story, (August) A-38
Wynder, Ernest L. (editor): The biologic effects of tobacco, (May) A-38

C

Campbell, Gilbert S.: Cardiac arrest, 661
Cancer, advanced breast, Hormonal treatment of, 76
Cancer, environmental, Causal and preventive aspects of, 5
Cancer, occult, Minnesota doctors are beginning to detect, 746
Cancer patient, terminal, Care of the, 614
Cannon, Paul R: Metabolic relationships of potassium, nitrogen and sodium, 567
Carcinoma, Bronchogenic, with unusual presenting symptoms, 462
Carcinoma of the laryngopharynx, 785
Cardiac arrest, 661
Cardiovascular abnormalities, certain congenital, in infants and children, Surgical treatment of, 1
Cardiovascular diagnosis, The position of radiology in, 276
Cardiovascular disease, organic, Functional manifestations in, 744
Cardiovascular system, Smoking and the, 111
Care of the terminal cancer patient, 615
Carey, James B., Jr.: The diagnostic usefulness of peritoneoscopy, 413
Carlander, Lester W.: Fractures of the metacarpals, metatarsals and phalanges, 301
Carlander, Lester W.: Treatment of severe injuries of the hand, 149
Causal and preventive aspects of environmental cancer, 5
Cervical traction and other physical therapeutic procedures for pain about the neck and shoulders, 373
Changing character of infections as a result of the era of chemotherapy, The, 642
Chemotherapy, The changing character of infections as the result of the era of, 642
Chest diseases, Bronchography in, 812
Children, Accidents of, 392
Children and farm accidents, 529
Chisholm, Tague C., Berglund, Eldon, and Thompson, Willis H.: Familial absence of mesenteric *(correction,* myenteric) plexus as a cause of bowel obstruction in the newborn, 447
Chisholm, Tague C., Spencer, Bernard J., and Wyatt, O. S.: Pheochromocytoma in a seven-year-old girl, 220
Chlorpromazine therapy complicated by agranulocytosis and jaundice, 740
Cholecystitis, Acute, and choledocholithiasis, 675
Cholecystography, New techniques in, 433
Chronic lower lip lesions, 527
Chronic pyuria, 281
Clark, Edward C., and Yoss, Robert E.: Nervous system findings associated with systemic lupus erythematosus, 517
Clinical problem of syphilis today, The, 717
Clinical method of assessing drug therapy in Parkinsonism, A, 659
Coe, John I., and Davidson, Robert C.: Renal artery aneurysm causing malignant hypertension, 671
Colcher-Sussman method, X-ray pelvimetry by the, 583
Colloidal radioactive gold 198, Therapy of serous cavity effusion with, 521
Colon, sigmoid, Sigmoido-perineal fistula from diverticulitis of the, 513
Colon, the small intestine and, Congenital obstruction of, 647
Communicability of infectious hepatitis, 768
Comparative effectiveness of a weighed reduction diet and an approximate-measure diet, 667
Congenital hemihypertrophy and hemihypoplasia, 461
Congenital obstruction of the small intestine and colon, 647
Congenital peripheral arteriovenous communications, 389
Connolly, Coleman, Lewis, F. John, Reeves, Melvin M., Baronofsky, Ivan D., and Tongen, Lyle: Resectional surgery for pulmonary tuberculosis, 577
Corr, Donald J., and Wellman, William E.: Reactions to penicillin.
  I. Review of the literature concerning severe reactions (English and North American), 599
  II. The incidence of mild reactions to procaine penicilin G in aqueous suspension, 678
  III. Reactions during 1952, 742
Cortisone, ACTH and, in agranulocytosis, 454
Cosgriff, J. A., Fleming, D. S., and Hirschboeck, F. J.: Minnesota rheumatic fever survey—1955, 208
Crash injury, automotive, research program, Minnesota, 457
Creevy, C. D.: Chronic pyuria, 281
Creevy, C. D., and Reiser, M. P.: Hypernephroma in infancy and childhood, 539
Creevy, C. D., and Reiser, M. P.: Metastatic neoplasms of the penis, 444

Cancer Detection

Minnesota doctors are beginning to detect occult cancer, 746

Clinical Notes

Care of the terminal cancer patient, 615
Xylocaine jelly for topical urethral anesthesia, 417

Clinical-Pathological Conference

Case presentation (Pseudomembranous ulcerative enteritis), 230

Committee Action

Tuberculosis, 688

Continuation Studies

Acute cholecystitis and choledocholithasis, 675
Anesthesia for emergency surgery, 803
Diagnostic usefulness of peritoneoscopy, The, 413
Dysphagia, 479
Fractures of the metacarpals, metatarsals and phalanges, 301
Genesis of intestinal atresia, The, 745
Glaucoma and the family doctor, 611
Growth hormone, 223
Infectious and postinfectious encephalitis, 169
Psychiatric aspects of the handicapped child, 541

Current Concepts

Diagnosis and treatment of thromboangiitis obliterans (Buerger's disease), 303
Functional heart disease, 545
Functional heart pain, 677
Functional manifestations in organic cardiovascular disease, 744
Hypotensive drugs, 173
Lymphedema, 415
Peripheral arterial embolism, 475
Physical signs of functional heart disease, 617
Present status of the treatment of varicose veins, The, 228
Smoking and the cardiovascular system, 111
Value of prolonged anticoagulant therapy, The, 39

D

Dahl-Iversen, E: Function of the endocrine organs during the postoperative period, 365
Dahlin, David C., Ghormley, Ralph K., and Atmore, William G.: Pigmented villonodular synovitis, 196
Davidson, Robert C., and Coe, John I.: Renal artery aneurysm causing malignant hypertension, 671
Deafness, Industrial, 655
Dehydration, Electrolyte disturbances in, 290
Depressions, certain involutional, Harmful effects of interpretive psychotherapy in, 451
Dermabrasion, Treatment of cutaneous scars by, 524
Dermatology, The use of liquid oxygen in, 151
Diabetes mellitus, The eye in, 781
Diagnosis and treatment of thromboangiitis obliterans (Buerger's disease), 303
Diagnosis, Arteriography as an aid to, 378
Diagnostic standards and classification of tuberculosis, 307
Diagnostic usefulness of peritoneoscopy, The, 413

Diphragmatic hernia, Traumatic, with strangulation and gangrene of the stomach, 795
Diet, Comparative effectiveness of a weighed reduction diet and an approximate-measure, 667
Differential diagnosis of acute poliomyelitis, 359
Differential diagnosis of lymphocytosis and leukemia, 226
Diverticulitis of the sigmoid colon, sigmoido-perineal fistula from, 513
Divertie, Matthew B., and Hodgson, Corrin H.: The systemic mycoses, 103
Drainage, Suction, for the prevention of dead space in surgical wounds, 206
Drugs, Hypotensive, 173
Drug therapy in Parkinsonism, A clinical method of assessing, 659
Dushane, James W., Kirklin, John W., and Bernatz, Philip E.: Surgical treatment of certain congenital cardiovascular abnormalities in infants and children, 1
Dysphagia, 479

The Dean's Page

Education for general practice, 185
Laboratory medicine, 246
Leadership in medicine, 318
Wanted: more applicants for medical schools, 51

E

Eder, W. P.: Accidental gunshot wounds, 159
Eder, W. P.: Massive upper gastrointestinal bleeding, 94
Egdahl, Richard H.: Recent advances in the field of homologous transplants, 665
Eiler, John: Hematoma of the rectus abdominis muscle, 219
Electrolyte disturbances in dehydration, 290
Ellwood, Paul M., Jr.: Infectious and postinfectious encephalitis, 169
Embolism, Fat, 775
Embolism, Peripheral arterial, 475
Encephalitis, Infectious and postinfectious, 169
Endocrine organs, Function of the, during the postoperative period, 365
Engels, Edward P., Paulson, E. C., and Mosser, Donn G: Therapy of serous cavity effusion with colloidal radioactive gold—198, 521
Enteritis, Pseudomembranous ulcerative, 234
Eosinophilia in malignant disease, 101
Erickson, Donald J.: Cervical traction and other physical therapeutic procedures for pain about the neck and shoulders, 373
Esophageal hiatus hernia, 141
Esophageal obstruction, tracheal and, Hematoma of the retropharyngeal space causing, 33
Estes, J. Earle, Jr.: Present concept of the treatment of arteriosclerosis obliterans, 203
Extrathyroidal hypermetabolism due to a pheochromocytoma, 792
Eye in diabetes mellitus, The, 781

Editorial

Activities of the Medical Testimony Committee, 238
Agammaglobulinemia, 308
Alcohol and driving, 311
Alcoholism, 179
American Academy of Occupation Medicine, 750
Architect's role, The, 752
Ballistocardiogram, The, 686
Bank coupon and collection services, 549
Banks and investment services, 119
Blue Cross and "take-home drugs," 239
Cashier's check and bank draft, The, 419
Changing concepts in psychosomatic reactions, 308
Changing pattern of bank loans, 179
Color TV—the big quandary, 621
Contribution of clinical psychology to psychosomatic medicine, A, 418
Convenience foods, 553
Degenerative complications of diabetes, The, 815
Divorce and family relationships, 43
Doctors—not time—should make the diagnosis of cancer, 240
Does the physician need an architect? 177
Electrocardiography: use and misuse, 418
Electrokymography, 618
Estate planning for physicians, 309
Etching process, The, 683
Group therapy, 115
History of glass containers, The, 311, 420, 484, 551, 621, 684
Homemaker service, 178
Income management, 118
Inside looking out, 751
Insulin reactions, 747
Internship and licensure, The, 116
Intracardiac pressure tracings, 548
Introduction to photoengraving, 549
Listening ability and success, 236
Medical ethics in routine practice, 118
Medical student committee, The, 747
Minnesota human genetics league, The, 748, 817
Modern penology, 422
Nature of alcoholism, The, 420
Need for hospitals and related facilities in Minnesota, The, 749, 815
New fields and responsibilities in tuberculosis research, 44
New look, 120
Nursing team, The, 44
Oral communication, 40
Our new frontier, 550
Paint—its use and value, 310
Pay television? 552
Phonocardiography: a lost opportunity, 484
Photoengraving—color process, 821
Physicians-hospitals-public, 481
Photoengraving, 620
Pre-medical student and medical school, The, 816
Present treatment of pulmonary emphysema, 41
Present status of veterinary medicine, 178
Psychiatric social worker in psychosomatic medicine, The, 681
Psychosomatic medicine, 41
Psychosomatic research, 481
Radiation protection for the technician in training, 240
Reader interest poll, 313
Readership survey, 625
Registry of medical technologists, The, 820
Rehabilitation in pulmonary tuberculosis, 422, 482, 551, 622, 685, 749, 819
Research and the practicing physician, 116
Safekeeping, 485
Salesmanship, 237
Scotson, 423
Serodiagnosis of cancer, 618
Sick leave and the taxpayer, 120
Steroids and arthritis, 236
Symptoms of alcoholism, The, 483
Syphilology, 176
Telephone "gadgets," 818
Telephone service, 751
Television and the youngsters, 482
Television: Everything for everybody? 421
Tracings of arterial and venous pulsations, The, 682
Travelers checks and letters of credit, 43
Treatment of tuberculosis today, The, 312
Trouble is their business, 623
TV facts of life, 683
Value of a savings account, 619
Vive la difference, 40
Water conservation, 548
What about reading? 176
What constitutes the practice of medicine? 241
What does "Blue Shield" mean to you? 681
When does the physician need an architect? 817
Who will become an alcoholic? 239

Why convenience foods? 624
Written and the spoken word. The, 115

F

Familial absence of mesenteric *(correction,* myenteric) plexus as a cause of bowel obstruction in the newborn, 447
Fat embolism, 775
Feinberg, S. B.: Roentgenographic findings in respiratory problems of infants, 285
Felder, Davitt A.: The present status of the treatment of varicose veins, 228
Fetus, macerated, Transitional hydatidiform mole with fulminating pre-eclampsia and a, 400
Fibroplasia, retrolental, Oxygen therapy in the premature infant as a cause of, 91
Fibroplasia, retrolental, Recommended practices in the prevention of, 61
Fistula, Sigmoido-perineal, from diverticulitis of the sigmoid colon, 513
Fleming, D. S., Hirschboeck, F. J., and Cosgriff, J. A.: Minnesota rheumatic fever survey—1955, 208
Folken, F. G.: Posttraumatic intraocular hemorrhage, 440
Fractures of the metacarpals, metatarsals and phalanges, 301
Franklin, Ruth E., and Rynearson, Edward H.: Comparative effectiveness of a weighed reduction diet and an approximate-measure diet, 667
Freeman, D. W.: X-ray pelvimetry by the Colcher-Sussman method, 583
Frykman, Howard M.: Sigmoido-perineal fistula from diverticulitis of the sigmoid colon, 513
Fuller, B. F., and Johnson, H. W.: Lymphedema, 415
Fuller, Josiah, Hirschboeck, Frank J., and LaBree, Robert H.: Hematoma of the retropharyngeal space causing tracheal and esophageal obstruction, 33
Fuller, J., and La Bree, R. H.: Esophageal hiatus hernia, 141
Functional heart disease, 545
Functional heart pain, 677
Functional manifestations in organic cardiovascular disease, 744
Functions of the endocrine organs during the postoperative period, 365

G

Garland, L. Henry: New techniques in cholecystography, 433
Garske, George L., and Twidwell, Joseph E.: Testicular tumor, 723
Gastrointestinal bleeding, Massive upper, 94
Genesis of intestinal atresia, The, 745
Genetic and familial aspects of central nervous conditions in children, 112
Ghormley, Ralph K., Atmore, William G., and Dahlin, David C.: Pigmented villonodular synovitis, 196
Glaucoma and the family doctor, 611
Glaucoma, Importance of the diagnosis of, 737
Gordon, J. R., Weatherhead, D. S. P., and Van Bergen, F. H.: Anesthesia for emergency surgery, 803
Greenberg, Albert J.: Communicability of infectious hepatitis, 768
Grotting,. John K.: Chronic lower lip lesions, 527
Growth hormone, 223
Gunshot wounds, Accidental, 159

H

Haglin, John J., Lillehei, C. Walton, Varco, Richard L., and Murphy, Thomas O.: The role of surgery in the treatment of arteriosclerosis of the major vessels, 703
Hallenbeck, George A.: Obstruction of the alimentary tract in the neonatal period, 265
Hand, Treatment of severe injuries of the, 149
Handicapped child, Psychiatric aspects of the, 541
Hanlon, David G.: Eosinophilia in malignant disease, 101
Hanson, Mark C. L.: A reconsideration of liver function tests, 764
Harmful effects of interpretive psychotherapy in certain involutional depressions, 451
Hastings, Donald W.: The patient who won't get well, 635
Heart disease, Functional, 545
Heart disease, functional, Physical signs of, 617
Heart pain, Functional, 677
Hematoma of the rectus abdominis muscle, 219
Hematoma of the retropharyngeal space causing tracheal and esophageal obstruction, 33
Hemihypertrophy and hemihypoplasia, Congenital, 461
Hemoglobin catabolism, The pyrrol pigments and, 294, 403, 467
Hemorrhage, Posttraumatic intraocular,. 440
Hennepin County neonatal mortality study, 586
Henoch-Schoenlein's purpura, 167
Hepatitis, Acute infectious: laboratory aids in management, 37
Hepatitis, infectious, Communicability of, 768
Hernia, Esophageal hiatus, 141
Hernia, Traumatic diaphragmatic, with strangulation and gangrene of the stomach, 795
Hirschboeck, F. J. Cosgriff, J. A., and Fleming, D. S.: Minnesota rheumatic fever survey—1955, 208
Hirschboeck, Frank J., LaBree, Robert H., and Fuller, Josiah: Hematoma of the retropharyngeal space causing tracheal and esophageal obstruction, 33
Hodges, Fred Jenner: The position of radiology in cardiovascular diagnosis, 276
Hodgson, Corrin H., and Divertie, Matthew B.: The systemic mycoses, 103
Hoffert, H., Potente, D., and Nerenberg, S. T.: Primary adenocarcinoma of the appendix associated with a "Krukenberg tumor," 536
Holland, Cleon R., and Merritt, Wallace A.: Lymphosarcoma, 144
Hollenhorst, Robert W.: Oxygen therapy in the premature infant as a cause of retrolental fibroplasia, 91
Home accident prevention, 214
Homografts, artery, Reconstruction of major blood vessels employing, 638
Homologous transplants, Recent advances in the field of, 665
Hookworm treatment of polycythemia vera, 99
Hormonal treatment of advanced breast cancer, 76
Hormone, Growth, 223
Horns, Richard C.: Glaucoma and the family doctor, 611
Howell, Llewelyn P., Roth, Grace M., and Scholz, Donald A.: Extrathyroidal hypermetabolism due to a pheochromocytoma, 792
Hueper, W. C.: Causal and preventive aspects of environmental cancer, 5
Hydatidiform role, Transitional, with fulminating pre-eclampsia and a macerated fetus, 400
Hypermetabolism, Extrathyroidal, due to a pheochromocytoma, 792
Hypernephroma in infancy and childhood, 539
Hypertension, malignant, Renal artery aneurysm causing, 671
Hypertrophy, ventricular, in adults, Problems in clinical diagnosis and classification of,
  I. Idiopathic left ventricular hypertrophy, 12
  II. Right ventricular hypertrophy, 83
  III. Familial cardiopathy, 153
Hypotensive drugs, 173

History of Medicine in Minnesota

Medical history of Rice County (1855-1901), 52, 250, 492, 694

I

Infectious hepatitis, Communicability of, 768
Importance of the diagnosis of glaucoma, 737
Importance of the pulmonary nodule, The, 127
Industrial deafness, 655

Infant, premature, Oxygen therapy in the, as a cause of retrolental fibroplasia, 91
Infants, Roentgenographic findings in respiratory problems of, 285
Infections, The changing character of, as the result of the era of chemotherapy, 642
Infectious and postinfectious encephalitis, 169
Inhalatiorum medicatio, 459
Intestinal atresia, The genesis of, 745
Intestine, small, and colon, Congenital obstruction of the, 647
Intraocular hemorrhage, Posttraumatic, 440
Is immunity to trichinosis being naturally acquired? 174
Iverson, Rolf M.: Pre-employment roentgenograms of the lower dorsal and lumbrosacral spine in young men, 771

In Memoriam

Adams, Richard Charles, 126
Baxter, Stephen Henry, 126
Bentley, Norman P., 625
Boyer, Samuel H., 63
Brigham, Charles Fay, Sr., 63
Carter, Frederick Gay, 261
Colp, Edward A., 261
Condit, William H., 429
Creighton, Ralph H., 63
Critchfield, Lyman Ray, 832
Dornblaser, H. Bright, 832
Dutton, Charles E., 63
Ericson, Reinhold Milton, 63
Garlock, Arthur V., 561
Giesen, Allan Francis, 261
Hartley, Everett C., 429
Hedberg, Gustaf A., 319
Hedin, Raymond F., 64
Hegge, Rolv Sigvard, 126
Higbee, Paul A., 429
Holland, William H., 625
Holst, John Burton, 64
Howard, Willard Samuel, 126
Johnston, Rufus O., 429
King, Edgar A., 505
Klein, Henry N., 319
Langhoff, Arthur H., (October) A-38
Larrabee, Scott G., 319
Larson, Ralph Hertrich, 832
Leavitt, Henry H., 319
Lebrowske, Joseph A., 319
Lee, Walter N., 261
Levin, Bert G., 261
McIntire, Homer M., 429
Maertz, William Frank, 180
Marclay, Walter J., 64
Miller, Samuel, 64
Naegeli, Frank, 832
Nelson, Oscar E., (October) A-38
Nelson, Robert Lyman, 65
Nilson, Helmer Jonas, (October) A-38
Noth, Henry W., 429
Osburn, Burt Frank, 65
Penhall, Fletcher W., 319
Potek, David, 261
Quist, Henry William, 65
Schmitz, Glenn P., 760
Senkler, George E., 262
Sivertsen, Ivar, 320
Sohmer, A. E., (October) A-39
Soper, John E., 320
Strobel, William G., 760
Thabes, John Alois, 65
Tingdale, August C., 505
Tracht, Robert R., 505
Ude, Walter Herman, 262
Van Beeck, Gregory, 320
Welles, Henry Journeay, 320
Wiltrout, Irving George, 262
Wolfe, Howard H., 65
Wray, William E., 320

J

Jacobson, Wyman, and Smith, Ralph: Clinical-pathological conference (pseudomembranous ulcerative enteritis), 230
Jensen, Reynold A.: Psychiatric aspects of the handicapped child, 541
Jeub, Robert P., and Michienzi, Leonard J.: Chlorpromazine therapy complicated by agranulocytosis and jaundice, 740
Johnson, Einer W., Jr.: Arteriography as an aid to diagnosis, 378
Johnson, H. W., and Fuller, B. F.: Lymphedema, 415

K

Kamman, Gordon R.: Harmful effects of interpretive psychotherapy in certain involutional depressions, 451
Kennedy, B. J.: Growth hormone, 223
Kierland, Robert R., Magath, Thomas B., and Perry, Harold O.: The clinical problem of syphilis today, 717
Kirklin, John W., Bernatz, Philip E., Dushane, John W.: Surgical treatment of certain congenital cardiovascular abnormalities in infants and children, 1
Kline, Richard F.: Bronchogenic carcinoma with unusual presenting symptoms, 462
"Krukenberg tumor," Primary adenocarcinoma of the appendix associated with a, 536
Kucera, William J., Jr., and Priest, Robert E.: Laryngocele—laryngeal air-sac of lower animals appearing in man, 137
Kvale, Walter F.: Hypotensive drugs, 173

L

Labor, Locked twins, chin to chin, obstructing, 35
LaBree, R. H., and Fuller, J.: Esophageal hiatus hernia, 141
LaBree, Robert H., Fuller, Josiah, and Hirschboeck, Frank J.: Hematoma of the retropharyngeal space causing tracheal and esophageal obstruction, 33
Lannin, B. G., Leven, N. Logan, and Tongen, Lyle A.: Congenital obstruction of the small intestine and colon, 647
Larson, Lawrence M., and Rosenow, John H.: Leiomyosarcoma of the small bowel, 710
Laryngocele—laryngeal air-sac of lower animals appearing in man, 137
Laryngopharynx, Carcinoma of the, 785
Laymon, Carl W., and Balogh, Charles J.: The use of liquid oxygen in dermatology, 151
Laymon, Carl W., and Balogh, Charles J.: Treatment of cutaneous scars by dermabrasion, 524
Leinfelder, P. J., and Owens, Frederick M., Jr.: Importance of the diagnosis of glaucoma, 737
Leiomyosarcoma of the small bowel, 710
Leukemia, lymphocytosis and, Differential diagnosis of, 226
Leven, N. Logan, Tongen, Lyle A., and Lannin, B. G.: Congenital obstruction of the small intestine and colon, 647
Lewis, F. John, Reeves, Melvin M., Baronofsky, Ivan D., Tongen, Lyle, and Connolly, Coleman: Resectional surgery for pulmonary tuberculosis, 577
Lillehei, C. Walton, and Murphy, Thomas O.: Traumatic pancreatitis with reference to the abetting influence of pancreatic stimuli, 465
Lillehei, C. Walton, Varco, Richard L., Murphy, Thomas O., and Haglin, John J.: The role of surgery in the treatment of arteriosclerosis of the major vessels, 703
Lip lesions, lower, Chronic, 527
Lipscomb, Paul R., and Weiner, Alan D.: Rupture of muscles and tendons, 731
Liver function tests, A reconsideration of, 764
Locked twins, chin to chin, obstructing labor, 35

Logan, George B., and Smid, Arthur C.: Accidents of children, 392
Logan, George B., and Smid, Arthur C.: Children and farm accidents, 529
Louw, J. H., and Barnard, C. N.: The genesis of intestinal atresia, 745
Lupus erythematosus, systemic, Nervous system findings associated with, 517
Lymphedema, 415
Lymphocytosis and leukemia, Differential diagnosis of, 226
Lymphosarcoma, 144

Laboratory Aids

Acute infectious hepatitis, laboratory aids in management, 37
Differential diagnosis of lymphocytosis and leukemia, 226
Is immunity to trichinosis being naturally acquired? 174

Letters to the Editor

Penn, H. S. (importance of seroflocculation reaction). (November) A-45
Silbernagel, Lester, 188
Trail, Richard R. (Papworth Village Settlement), 827

Mc

McCollister, Robert J.: Metabolism of melanin pigment, 800
McKenzie, Charles H., and Quist, Henry W. Jr.: Locked twins, chin to chin, obstructing labor, 35
McPheeters, H. O.: Treatment of varicose veins, 271

M

Magath, Thomas B., Perry, Harold O., and Kierland, Robert R.: The clinical problem of syphilis today, 717
Malerich, J. A., Jr.: A study of ruptured uteri, 16
Malignant disease, Eosinophilia in, 101
Massive upper gastrointestinal bleeding, 94
Mastoid surgery, The return of, 778
Maxeiner, S. R., Jr., and Maxeiner, Stanley, R.: Suction drainage for the prevention of dead space in surgical wounds, 206
Medicatio inhalatiorum, 459
Medicine in southern Minnesota, 165
Malanin pigment, Metabolism of, 800
Mentally retarded child, The physician and the, 509
Merritt, Wallace A., and Holland, Cleon, R.: Lymphosarcoma, 144
Mesenteric (*correction,* myenteric) plexus, Familial absence of, as a cause of bowel obstruction in the newborn, 447
Metabolic relationships of potassium, nitrogen and sodium, 567
Metabolism of melanin pigment, 800
Metacarpals, metatarsals and phalanges, Fractures of the, 301
Metastatic neoplasms of the penis, 444
Meyerding, E. A.: Diagnostic standards and classification of tuberculosis, 307
Michienzi, Leonard J., and Jeub, Robert P.: Chlorpromazine therapy complicated by agranulocytosis and jaundice, 740
Minnesota automotive crash injury research program, 457
Minnesota doctors are beginning to detect occult cancer, 746
Minnesota maternal mortality study for 1953, 381
Minnesota rheumatic fever survey—1955, 208
Moos, Daniel J.: Traumatic diaphragmatic hernia with strangulation and gangrene of the stomach, 795
Mosser, Donn G., Engels, Edward P., and Paulson, E. C.: Therapy of serous cavity effusion with colloidal radioactive gold—198, 521
Murphy, Thomas O., Haglin, John J., Lillehei, C. Walton, and Varco, Richard L.: The role of surgery in the treatment of arteriosclerosis of the major vessels, 703
Murphy, Thomas O., and Lillehei, C. Walton: Traumatic pancreatitis with reference to the abetting influence of pancreatic stimuli, 465
Murphy, Thomas O., Sandhaus, Sol, and Ryan, Joseph M.: Congenital peripheral arteriovenous communications, 389
Muscles and tendons, Rupture of, 731
Mycoses, The systemic, 103
Myhre, James, and Wallace, Franklin: Hookworm treatment of polycythemia vera, 99

Medical Economics

$35 million allocated for vocational rehabilitation, 629
AMA closes printing plant, 489
AMA law department sponsors meeting, 428
AMA revises principles of medical ethics, 630
Administration opposes disability payments under social security, 315
Administration sponsors legislation for mental health study, 489
Administration urges construction aid to medical schools, 628
Allocation program of salk vaccine ends, 628
Are doctors good businessmen? 316
Are doctors really overpaid? 488
Cabinet status asked for U. S. civil defense agency, 628
Cancer research may benefit, 123
Catastrophic health insurance for federal employes, 317
Colorado and Idaho decisions, 183
Combatting malpractice actions, 557
Commissions for osteopaths still in doubt, 428
Conference on aging, 557
Cost of proposed medical research, 123
County Society officers meeting, 243
Doctors' fees still behind overall cost of living, 629
Dependent medical care program goes into effect, 823
Doctor draft to end July 1, 824
Doctors top earners among professions in Canada, 489
Election results affect health bills, 823
Family income before taxes up in 1955, 629
Federal grants for medical research, 757
Fee complaints not necessarily based on fees, 428
Ford Foundation gives $10 million to funds for medical schools, 426
Foreign medical school graduates to be evaluated, 489
Government investigates abuses in VA outpatient program, 428
Group life insurance, 244
House of Delegates passes series of important recommendations, 487
Iowa decision upholds doctors, 182
Judd speaks at SAMA meeting, 426
Leaders predict future of medical practice, 856
Legislation outlawing dangerous chemicals proposed, 756
Legislative review of the 84th Congress, 690
Limit raised on charitable contributions to medical research groups, 692
Medical assistance bills introduced, 428
Medical costs not highly criticised, 558
Medical library bill, 317
Medical schools in United States show vast expansion, 692
Medical students' income sources listed, 557
Medical surveys of interest, 558
Medicine ranked most desirable career by teen-agers, 629
Military dependent medical care bill passes both houses, 488
Military dependents' health insurance, 123
Military medical legislation bills go through house, 427
Minnesotan receives appointment, 488
Narcotics control bill passes congress, 628
National legislation, 244
New American Medical Directory completed, 426
New grants for vitamin, nutrition research, 558
New poll reveals physicians' opinions on social security, 755
New Surgeon General, 756
New version of Alaskan mental health bill proposed, 427

North Central conference reviews medical economic problems, 824
North Central Medical Conference meets in Saint Paul, 49
Number of specialists on the rise, 630
Office of civil aviation medicine proposed, 427
Passage of H.R. 7225 makes more government funds available for medical care, 823
Patients' code of conduct rejected, 631
Physicians can deduct for refresher courses, 630
Physicians to be drafted for navy duty, 489
Presidential signature completes action on other bills, 628
President's 1956 health message, 184
President signs military dependents' medical care bill, 556
President signs social security bill, 628
Recent surveys reveal statistics of interest to physicians, 692
Results of physicians' social security poll announced, 487
Sears Foundation continues practice grants, 245
Sears, Roebuck Foundation announces loans, 629
Senate and House actions on matters of medical interest, 556
Senate committee acts on H.R. 7225, 488
Senate committee approves two health bills, 427
Social security—big issue in 1956, 48
Some doctors miss this treat, 317
State of the Union message, 122
Study shows aged becoming less dependent, 629
Supreme court to review numerous medical cases, 757
Two measures may affect aged, 427
U. S. warns public against Hoxsey cancer treatment, 427
VA to investigate value of "tranquilizing" drugs, 489
West German medical education surveyed, 629
What Americans spend for medical care, 756
What do doctors think of social security? 316
WHO assembly reinstates Russia; reduces her bill, 488
Why hospital costs are high, 426
WMA acts as international voice of organized medicine, 488
Women physicians outnumber men in USSR, 629

Meetings and Announcements

Aero Medical Association, 187, 758
American Academy of General Practice, 66
American Board of Obstetrics and Gynecology, 258 430, 505, 564
American Cancer Society fellowships, 322
American College of Chest Physicians essay contest, 632
American College of Gastroenterology, 322, 564
American College of Physicians, 431, 633
American Goiter Association award, 564
American Heart Association
    Accepting applications, 505
    Proceedings published, 431
American Institute of Dental Medicine, 66
American Urological Association award, 505
Bibliography of medical reviews, 124
Camp Courage opens in June, 322
Clinical reviews at Mayo Clinic, 66
Continuation courses, 67, 125, 564, 633, 700, 758, 830
Course in electrocardiology, 700
Courses in pediatrics, 187
Crippled Children Services
    Spring clinic schedule, 258
    Fall clinic schedule, 633
Eighteen state radio stations air new health series, 829
Foundation fund provides opportunities for physicians and communities, 564
Friedman, Jack, memorial lecture, 701
General practice fall refresher, 633
Gray, Howard K., memorial fund, 700
Hawaii Medical Association, 66
Heart disease publication, 633
Help detect occult cancer, 693
Infertility essay contest, 632
International College of Surgeons, 66, 431, 505
International Congress on Diseases of the Chest, 431
International Congress of Human Genetics, 124
Kenny Foundation scholarships, 701
Licensure examination, 830
Mediclinics of Minnesota, 258
Minneapolis Obstetrical and Gynecological Society, 67
Minneapolis Surgical Society, 258
Minnesota Academy of General Practice, 563
Minnesota Academy of Ophthalmology and Otolaryngology, 258, 322
Minnesota Society of Neurology and Psychiatry, 124, 258, 431, 700
Minnesota State Board of Medical Examiners, 187
Minnesota State Medical Association
    Preliminary program—103rd annual meeting, 247
    Roster, 323
Minnesota Surgical Society, 505
Mississippi Valley Medical Society 1957 essay contest, 830
New Orleans Graduate Medical Assembly, 758
Northern Minnesota Medical Association
    Meeting, 431
    Officers, 700
    Program, 563
Pan American Medical Women's Alliance, 66
Psychiatric aide program, 633
Postgraduate courses at New York University, 564
Program of surgery for congenital cardiac malformations, 124
Schering award competition, 186
St. Paul Society of Internal Medicine, 187
St. Paul Surgical Society, 187, 258
Southern Minnesota Medical Association annual meeting, 563
Winona County Society, 187
World Medical Association plans second conference, 758

Minnesota State Board of Medical Examiners

Granite Falls "reflexologist" sentenced for illegal healing (Percy Graham), 503
License of Sandstone physician revoked (Frank A. Rudolph), 693
Man impersonating physician sentenced to fifteen-year prison term for grand larceny (Raymond Thayer Lawton), 245
Minneapolis quack sentenced for illegal healing (Davis Stern), 503
Minneapolis man sentenced for violation of basic science law (Lafayette M. Gray), 245
Minneapolis man sentenced for violating city drug ordinance (Robert P. Selisky), 828
Minneapolis woman sentenced on abortion charge (Helen Hicks), 125
Montevideo man sentenced on abortion charge (Omer Peterson), 67
Physicians licensed February 4, 1955, 497
Physicians licensed May 6, 1955, 498
Physicians licensed July 8, 1955, 499
Physicians licensed November 4, 1955, 502
Physician's license revoked following abortion conviction (William L. Minkowski), 503
Saint Paul quack sentenced to workhouse for one year (Frank H. Gold), 184
Saint Paul quack committed to Hastings State Hospital as mentally ill (Frank Herman Gold), 828
South Dakota "reflexologist" sentenced at Montevideo for illegal practice of healing (William A. McKay) 828

Miscellaneous

AMA delegates' report, 62

N

Neck and shoulders, pain about the, Cervical traction and other physical therapeutic procedures for, 373
Nelson, Maynard C.: Acute recurrent pancreatitis, 789
Neonatal mortality study, Hennepin County, 586
Neonatal period, Obstruction of the alimentary tract in the, 265

Neoplasms, Metastatic, of the penis, 444
Nerenberg, S. T., Hoffert, H., and Potente, D.: Primary adenocarcinoma of the appendix associated with a "Krukenberg tumor," 536
Nervous conditions central, in children, Genetic and familial aspects of, 112
Nervous system findings associated with systemic lupus erythematosus, 517
New problems in the tuberculosis field, 613
New techniques in cholecystography, 433
Nitrogen, sodium and potassium, Metabolic relationships of, 567
Nodule, pulmonary, The importance of the, 127

O

Obstruction, Congenital, of the small intestine and colon, 647
Obstruction of the alimentary tract in the neonatal period, 265
Olive, John T., and Thiem, Chester E.: Henoch-Schoenlein's purpura, 167
Olson, L. A., and Williams, M. M.: New problems in the tuberculosis field, 613
Owens, Frederick M., Jr.: Care of the terminal cancer patient, 614
Owens, Frederick M., Jr.: Peripheral arterial embolism, 475
Owens, Frederick M., Jr.: Reconstruction of major blood vessels employing artery homografts, 638
Owens, Frederick M., Jr., and Leinfelder, P. J.: Importance of the diagnosis of glaucoma, 737
Oxygen, liquid, The use of, in dermatology, 151
Oxygen therapy in the premature infant as a cause of retrolental fibroplasia, 91

P

Pancreatitis, Acute recurrent, 789
Pancreatitis, Traumatic, with reference to the abetting influence of pancreatic stimuli, 465
Papermaster, T. C.: Differential diagnosis of acute poliomyelitis, 359
Parkinsonism, A clinical method of assessing drug therapy in, 659
Patient who won't get well, The, 635
Paulson, Donald L.: The importance of the pulmonary nodule, 127
Paulson, Elmer C.: Radioiodine uptake in the diagnosis of thyroiditis, 387
Paulson, E. C., Mosser, Donn G., and Engels, Edward P.: Therapy of serous cavity effusion with colloidal radioactive gold—198, 521
Pelvimetry, X-ray, by the Colcher-Sussman method, 583
Penicillin, Reactions to.
  I. Review of the literature concerning severe reactions (English and North American), 599
  II. The incidence of mild reactions to procaine penicillin G in aqueous suspension, 678
  III. Reactions during 1952, 742
Penis, Metastatic neoplasms of the, 444
Penn, Harry S.: The present status of the seroflocculation reaction, 571
Peripheral arterial embolism, 475
Peritoneoscopy, The diagnostic usefulness of, 413
Perry, Harold O., Kierland, Robert R., and Magath, Thomas B.: The clinical problem of syphilis today, 717
Phalanges, Metacarpals, metatarsals and, Fractures of the, 301
Pheochromocytoma, Extrathyroidal hypermetabolism due to a, 792
Pheochromocytoma in a seven-year-old girl, 220
Photograph, R. H. Wilson, M.D., president, Minnesota State Medical Association, 47
Physical signs of functional heart disease, 617
Physician and the mentally retarded child, The, 509
Pierce, Jack R., and Winkler, Edward G.: Why not pack the postpartum uterus? 89
Pigmented villonodular synovitis, 196
Pigment, melanin, Metabolism of, 800
Poliomyelitis, acute, Differential diagnosis of, 359
Poliomyelitis, The various mechanisms of suffocation in, 761
Polycythemia vera, Hookworm treatment of, 99
Position of radiology in cardiovascular diagnosis, The, 276
Posttraumatic intraocular hemorrhage, 440
Potassium, nitrogen and sodium, Metabolic relationships of, 567
Potente, D., Nerenberg, S. T., and Hoffert, H.: Primary adenocarcinoma of the appendix associated with a "Krukenberg tumor," 536
Prasad, Ananda S.: Banti's syndrome, 28
Pre-eclampsia, fulminating, and a macerated fetus, Transitional hydatidiform mole with, 400
Pre-employment roentgenograms of the lower dorsal and lumbosacral spine in young men, 771
Pregnancy, The use of blood and plasma expanders during the third trimester of, 87
Premature infant, Oxygen therapy in the, as a cause of retrolental fibroplasia, 91
Present concept of the treatment of arteriosclerosis obliterans, 203
Present status of the serofloocculation reaction, 571
Present status of the treatment of varicose veins, The, 228
Price, W. E., Webb, E. A., and Smith, B. A.: Xylocaine jelly for topical urethral anesthesia, 417
Prickman, Louis E., Sommerville, Robert L., and Steinmetz, Rodney D.: Study of 200 consecutive patients hospitalized for asthma, 20
Priest, Robert E., and Kucera, William J., Jr.: Laryngocele—laryngeal air-sac of lower animals appearing in man, 137
Primary adenocarcinoma of the appendix associated with a "Krukenberg tumor," 536
Problems in clinical diagnosis and classification of ventricular hypertrophy in adults
  I. Idiopathic left ventricular hypertrophy, 12
  II. Right ventricular hypertrophy, 83
  III. Familial cardiopathy, 153
Prospect for tuberculosis control, The, 23
Pseudomembranous ulcerative enteritis, 234
Psychiatric aspects of the handicapped child, 541
Psychotherapy, interpretive, Harmful effects of, in certain involutional depressions, 451
Pulmonary nodule, The importance of the, 127
Purpura, Henoch-Schoenlein's, 167
Pyrrol pigments and hemoglobin catabolism, The, 294, 403, 467
Pyuria, Chronic, 281

President's Letter

Cancer detection in the physician's office, 554
Continued support for American Medical Education Foundation, 754
Dependent medical care, 687
First message (greetings), 47
Golden age of medicine, The, 490
Group liability insurance, 121
Minnesota and the American Medical Education Foundation, 242
Physicians and social security, 424
Presidential address, The, 626
Survey on nation's physicians, 181
Swan song, 822
Tribute to organized medicine, A, 314

Public Health

Recommended practices in the prevention of retrolental fibroplasia, 61

Pulmonary Page

Bronchography in chest diseases, 812
New problems in the tuberculosis field, 613

Q

Quist, Henry W., Jr., and McKenzie, Charles H.: Locked twins, chin to chin, obstructing labor, 35

R

Radioactive gold 198, colloidal, Therapy of serous cavity effusion with, 521
Radioiodine uptake in the diagnosis of thyroiditis, 387
Radiology, The position of, in cardiovascular diagnosis, 276
Reactions to penicillin
  I. Review of the literature concerning severe reactions (English and North American), 599
  II. The incidence of mild reactions to procaine penicillin G in aqueous suspension, 678
  III. Reactions during 1952, 742
Recent advances in the field of homologous transplants, 665
Reconsideration of liver function tests, A, 764
Reconstruction of major blood vessels employing artery homografts, 638
Rectus abdominis muscle, Hematoma of the, 219
Reeves, Melvin M., Baronofsky, Ivan D., Tongen, Lyle, Connolly, Coleman, and Lewis, F. John: Resectional surgery for pulmonary tuberculosis, 577
Regnier, E. A.: Hormonal treatment of advanced breast cancer, 76
Reiser, M. P., and Creevy, C. D.: Hypernephroma in infancy and childhood, 539
Reiser, M. P., and Creevy, C. D.: Metastatic neoplasms of the penis, 444
Renal artery aneurysm causing malignant hypertension, 671
Resectional surgery for pulmonary tuberculosis, 577
Respiratory problems of infants, Roentgenographic findings in, 285
Retarded child, mentally, The physician and the, 509
Retrolental fibroplasia, Oxygen therapy in the premature infant as a cause of, 91
Retrolental fibroplasia, Recommended practices in the prevention of, 61
Retropharyngeal space, Hematoma of the, causing tracheal and esophageal obstruction, 33
Return of mastoid surgery, The, 778
Rheumatic fever survey, Minnesota—1955, 208
Roentgenograms, Pre-employment, of the lower dorsal and lumbosacral spine in young men, 771
Roentgenographic findings in respiratory problems of infants, 285
Role of surgery in the treatment of arteriosclerosis of the major vessels, 703
Rosenfield, A. B.: Home accident prevention, 214
Rosenfield, A. B.: Minnesota automotive crash injury research program, 457
Rosenow, John H., and Larson, Lawrence M.: Leiomyosarcoma of the small bowel, 710
Roth, Grace M.: Smoking and the cardiovascular system, 111
Roth, Grace M., Scholz, Donald A., and Howell, Llewelyn P.: Extrathyroidal hypermetabolism due to a pheochromocytoma, 792
Rupture of muscles and tendons, 731
Rusk, Howard A.: Sick people in a troubled world, 161
Ryan, Joseph M., Murphy, Thomas O., and Sandhaus, Sol: Congenital peripheral arteriovenous communications, 389
Rynearson, Edward H., and Franklin, Ruth E.: Comparative effectiveness of a weighed reduction diet and an approximate-measure diet, 667

S

Sanders, Arthur I., and Wallace, Franklin G.: Trichinosis, a declining infection, 157
Sandhaus, Sol, Ryan, Joseph M., and Murphy, Thomas O.: Congenital peripheral arteriovenous communications, 389
Scars, cutaneous, Treatment of, by dermabrasion, 524
Scholz, Donald A., Howell, Llewelyn P., and Roth, Grace M.: Extrathyroidal hypermetabolism due to a pheochromocytoma, 792
Sears, Roebuck Foundation, Activities of the, 532
Segal, Maurice S.: Medicatio inhalatiorum, 459
Seldon, Thomas H.: The use of blood and plasma expanders during the third trimester of pregnancy, 87
Seroflocculation reaction, The present status of the, 571
Serous cavity effusion, Therapy of, with colloidal radioactive gold—198, 521
Shapiro, Sidney K.: A clinical method of assessing drug therapy in Parkinsonism, 659
Shoulders, neck and, Cervical traction and other physical therapeutic procedures for pain about the, 373
Sick people in a troubled world, 161
Sigmoido-perineal fistula from diverticulitis of the sigmoid colon, 513
Simonton, Kinsey M.: Industrial deafness, 655
Smid, Arthur C., and Logan, George B.: Accidents of children, 392
Smid, Arthur C., and Logan, George B.: Children and farm accidents, 529
Smith, B. A., Price, W. E., and Webb, E. A.: Xylocaine jelly for topical urethral anesthesia, 417
Smith, Graham G.: Dysphagia, 479
Smith, Graham G.: The return of mastoid surgery, 778
Smith, Ralph, and Jacobson, Wyman: Clinical-pathological conference (pseudomembranous ulcerative enteritis), 230
Smoking and the cardiovascular system, 111
Sodium, potassium and nitrogen, Metabolic relationships of, 567
Sommers, Ben: Problems in clinical diagnosis and classification of ventricular hypertrophy in adults
  I. Idiopathic left ventricular hypertrophy, 12
  II. Right ventricular hypertrophy, 83
  III. Familial cardiopathy, 153
Sommerville, Robert L., Steinmetz, Rodney D., and Prickman, Louis E.: Study of 200 consecutive patients hospitalized for asthma, 20
Spencer, Bernard J., Wyatt, O. S., and Chisholm, Tague C.: Pheochromocytoma in a seven-year-old girl, 220
Spine, lower dorsal and lumbosacral, in young men, Pre-employment roentgenograms of the, 771
Steinmetz, Rodney D., Prickman, Louis E., and Sommerville, Robert L.: Study of 200 consecutive patients hospitalized for asthma, 20
Stilwell, George G.: Acute infectious hepatitis: laboratory aids in management, 37
Study in ruptured uteri, A, 16
Study of 200 consecutive patients hospitalized for asthma, 20
Suction drainage for the prevention of dead space in surgical wounds, 206
Sundberg, Dorothy: Differential diagnosis of lymphocytosis and leukemia, 226
Surgery, emergency, Anesthesia for, 803
Surgical treatment of certain congenital cardiovascular abnormalities in infants and children, 1
Swain, Francis M.: Transitional hydatidiform mole with fulminating pre-eclampsia and a macerated fetus, 400
Synovitis, Pigmented villonodular, 196
Syphilis today, The clinical problem of, 717
Systemic mycoses, The, 103

Seminar

Banti's syndrome, 28
Metabolism of melanin pigment, 800
Pyrrol pigments and hemoglobin catabolism, The, 294, 403, 467
Reactions to penicillin
  I. Review of the literature concerning severe reactions (English and North American), 599
  II. The incidence of mild reactions to procaine penicillin G in aqueous suspension, 678
  III. Reactions during 1952, 742
Systemic mycoses, The, 103

T

Tendons, muscles and, Rupture of, 731
Testicular tumor, 723
Therapy of serous cavity effusion with colloidal radioactive gold—198, 521

Thiem, Chester E., and Olive, John T.: Henoch-Schoenlein's purpura, 167
Thompson, John H., Jr.: Is immunity to trichinosis being naturally acquired? 174
Thompson, Willis H., Chisholm, Tague C., and Berglund, Eldon: Familial absence of mesenteric (*correction*, myenteric) plexus as a cause of bowel obstruction in the newborn, 447
Thromboangiitis obliterans (Buerger's disease), Diagnosis and treatment of, 303
Thyroiditis, Radioiodine uptake in the diagnosis of, 387
Tongen, Lyle, Connolly, Coleman, Lewis, F. John, Reeves, Melvin M., and Baronofsky, Ivan D.: Resectional surgery for pulmonary tuberculosis, 577
Tongen, Lyle A., Lannin, B. G., and Leven, N. Logan: Congenital obstruction of the small intestine and colon, 647
Tongue, Abscess of the, 597
Top, F. H.: The changing character of infections as the result of the era of chemotherapy, 642
Tracheal and esophageal obstruction, Hematoma of the retropharyngeal space causing, 33
Transitional hydatidiform mole with fulminating pre-eclampsia and macerated fetus, 400
Transplants, homologous, Recent advances in the field of, 665
Traumatic diaphragmatic hernia with strangulation and gangrene of the stomach, 795
Traumatic pancreatitis with reference to the abetting influence of pancreatic stimuli, 465
Treatment of atrioventricular block, 787
Treatment of cutaneous scars by dermabrasion, 524
Treatment of severe injuries of the hand, 149
Treatment of varicose veins, 271
Trichinosis, a declining infection, 157
Trichinosis, Is immunity to, being naturally acquired? 174
Troubled world, Sick people in a, 161
Tsai, S. H.: Bronchography in chest diseases, 812
Tuberculosis control, The prospect for, 23
Tuberculosis, Diagnostic standards and classification of, 307
Tuberculosis field, New problems in, 613
Tuberculosis, pulmonary, Resectional surgery for, 577
Tumor, Testicular, 723
Twidwell, Joseph E., and Garske, George L.: Testicular tumor, 723
Twins, Locked, chin to chin, obstructing labor, 35

Tumor Conference

Case study—A.F. (Mount Sinai Hospital), 813
Case study—J.J. (St. Barnabas Hospital), 813
Case study—M.G.H., 53361, 546
Case study—M.G.H., 98389, 546
Case study, St. Barnabas Hospital, 680

U

Ulvestad, Harold S.: Carcinoma of the laryngopharynx, 785
Urethral anesthesia, topical, Xylocaine jelly for, 417
Use of blood and plasma expanders during the third trimester of pregnancy, The, 87
Use of liquid oxygen in dermatology, The, 151
Uteri, ruptured, A study of, 16
Uterus, postpartum, Why not pack the? 89

V

Value of prolonged anticoagulant therapy, The, 39
Van Bergen, F. H., Gordon, J. R., and Weatherhead, D. S. P.: Anesthesia for emergency surgery, 803
Varco, Richard L., and Aust, J. Bradley: Biliary stricture, 189
Varco, Richard L., Murphy, Thomas O., Haglin, John J., and Lillehei, C. Walton: The role of surgery in the treatment of arteriosclerosis of the major vessels, 703
Various mechanisms of suffocation in poliomyelitis, The, 761
Veins, varicose, The present status of the treatment of, 228
Veins, varicose, Treatment of, 271
Ventricular hypertrophy in adults, Problems in clinical diagnosis and classification of,
  I. Idiopathic left ventricular hypertrophy, 12
  II. Right ventricular hypertrophy, 83
  III. Familial cardiopathy, 153
Vessels, major, The role of surgery in the treatment of arteriosclerosis of the, 703
Vix, Vernon A.: Abscess of the tongue, 597

W

Wallace, Franklin, and Myhre, James: Hookworm treatment of polycythemia vera, 99
Wallace, Franklin G., and Sanders, Arthur I.: Trichinosis, a declining infection, 157
Wallace, William M.: Electrolyte disturbances in dehydration, 290
Wallinga, Jack V.: The physician and the mentally retarded child, 509
Watson, C. J.: The pyrrol pigments and hemoglobin catabolism, 294, 403, 467
Weatherhead, D. S. P., Van Bergen, F. H., and Gordon, J. R.: Anesthesia for emergency surgery, 803
Webb, E. A., Smith, B. A., and Price, W. E.: Xylocaine jelly for topical urethral anesthesia, 417
Weber, Lowell W.: Fat embolism, 775
Weiner, Alan D., and Lipscomb, Paul R.: Rupture of muscles and tendons, 731
Wellman, William E., and Corr, Donald J.: Reactions to penicillin.
  I. Review of the literature concerning severe reactions (English and North American), 599
  II. The incidence of mild reactions to procaine penicillin G in aqueous suspension, 678
  III. Reactions during 1952, 742
Wendland, John P.: The eye in diabetes mellitus, 781
White, S. Marx: The prospect for tuberculosis control, 23
Why not pack the postpartum uterus? 89
Williams, M. M., and Olson, L. A.: New problems in the tuberculosis field, 613
Winkler, Edward G., and Pierce, Jack R.: Why not pack the postpartum uterus? 89
Wohlrabe, A. Cabot: Treatment of atrioventricular block, 787
Wounds, surgical, Suction drainage for the prevention of dead space in, 206
Wyatt, O. S., Chisholm, Tague C., and Spencer, Bernard J.: Pheochromocytoma in a seven-year-old girl, 220

Woman's Auxiliary

Annual national convention, 565
Annual school of instruction attracts large turn-out, 760
Area plan, An, 259
Auxiliary members entertained at Northern, Southern meetings, 759
Baby sitter project for St. Louis County Auxiliary, 322
Grim, George, to speak at school of instruction, 634
"Magazines for friendship" program, 831
Mower County Auxiliary, 188
National convention, 322
New president-elect practices what she preaches, 634
News from county auxiliaries, 830
Officers and committee chairmen, 1956-1957, 506
  County officers, 701
President's message, 506
Radio as a public health service, 68
Ramsey County Auxiliary news, 68, 125
Report of mid-winter board meeting, 259
Two Minnesota officers attend Chicago conference, 759

X

X-ray pelvimetry by the Colcher-Sussman method, 583
Xylocaine jelly for topical urethral anesthesia, 417

Y

Yoss, Robert E., and Clark, Edward C.: Nervous system findings associated with systemic lupus erythematosus, 517

new!
calmative

nostyn®
2-ethylcrotonylurea, Ames

the power of gentleness
for relief of daily tensions

- moderates anxiety and tension
- avoids depression, drowsiness, motor incoordination

different!

- Nostyn is a new drug, a *calmative*
  - not a hypnotic-sedative
  - unrelated to any available chemopsychotherapeutic agent
- no evidence of cumulation or habituation
- does not cause diarrhea or gastric hyperacidity
- unusually wide margin of safety—no significant side effects

dosage: 150-300 mg. three or four times daily.

supplied: 300 mg. scored tablets, bottles of 48.

AMES COMPANY, INC • ELKHART, INDIANA

17656

clinically proved, before introduction, in over 12,000 patients

announcing

*Compazine**

a further advance in psychopharmacology

a true "tranquilizer" with specific action in psychic and psychosomatic conditions

indicated in mental and emotional disturbances — mild and moderate — encountered in everyday practice

available in 5 mg. tablets

minimal side effects

Few drugs have been so thoroughly studied before introduction or introduced with such a substantial background of clinical experience.

In the more than 12,000 cases treated with 'Compazine' here and abroad, and in experimental studies at very high dosage, no blood change or jaundice attributable to 'Compazine' was observed.

Smith, Kline & French Laboratories, Philadelphia 1

*Trademark for proclorperazine, S.K.F.

LIBRARY OF THE
COLLEGE OF PHYSICIANS
OF PHILADELPHIA

This Book is due on the last date stamped below. No further preliminary notice will be sent. Requests for renewals must be made on or before the date of expiration.

DUE	~~RETURNED~~ Due
DEC 9 1957	
MAR 14 1958	FEB 20 1962
JUL 2 1958	MAY 28 1962
AUG 27 1958	
APR 15 1959	JAN 30 1963
APR 22 1959	
	MAY 8 1963
APR 22 1959	FEB 1[illegible] 1963
MAY 20 1959	
MAY 20 1959	DEC 16 1966
DEC 18 1959	
	JUL 5 - 1968
FEB 3 1960	
JUN 29 1960	
JUN 29 1960	
FEB 16 1961	
APR 14 1961	
JAN 12 1962	

A fine of twenty-five cents will be charged for each week or fraction of a week the book is retained without the Library's authorization.